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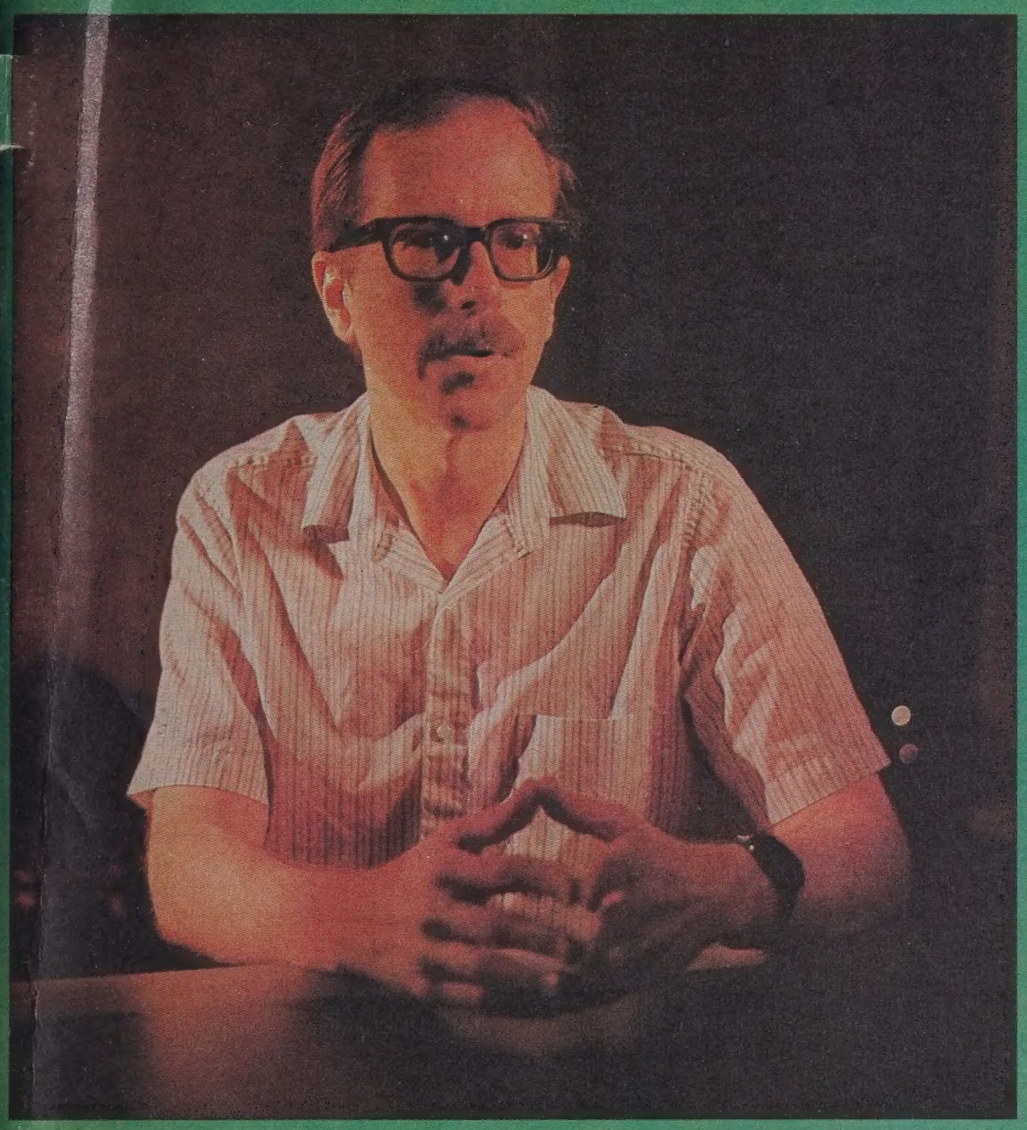

AutoDesk: The Next Generation

An Interview With Founder John Walker

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Story starts on page 52.

Yacco Builds A Hybrid Network

"A hybrid system has no disadvantage compared to a purebred one, and there are advantages to incorporating unshielded twisted pair in your network." Story starts on page 39.

Kodak's Photo CD

"Just when you're coming to terms with QuickTime, along comes another bonanza for computer-aided communication. Photo CD's features and capabilities will serve many needs of the mass and professional markets." Story starts on page 103.

Tales Of PowerBook Repair

"If disaster strikes your PowerBook, you're not stranded. Apple is doing an exemplary support job with its toll-free hotline and free-of-charge warranty service." See page 64.

PREVIEW: Downsizing/Rightsizing Expo—Page 50

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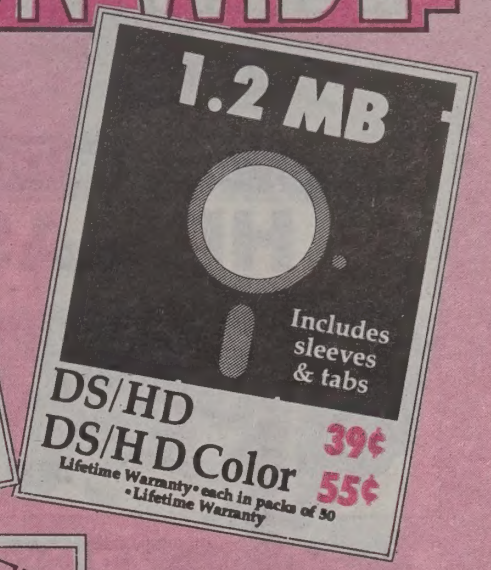

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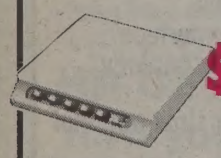

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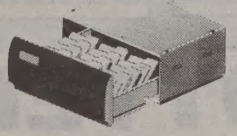

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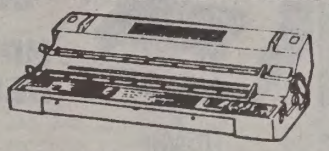

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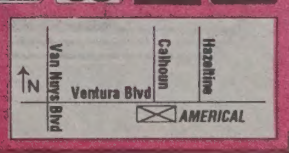

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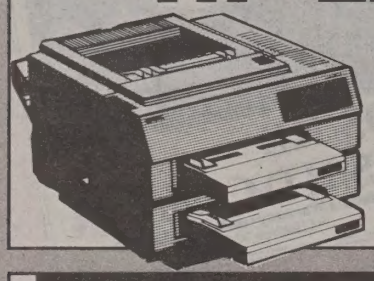

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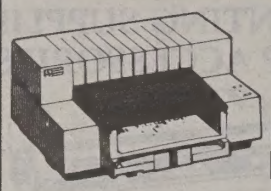

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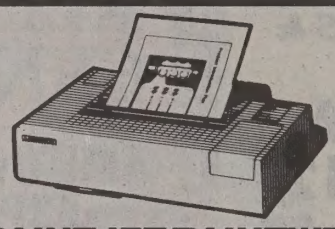

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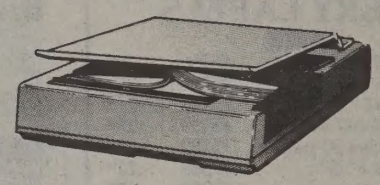

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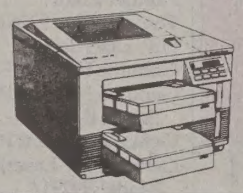

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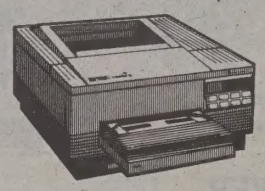

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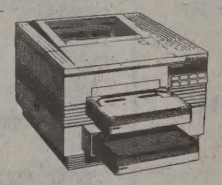

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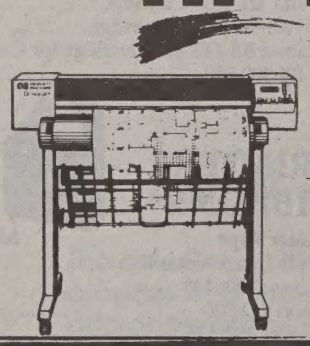

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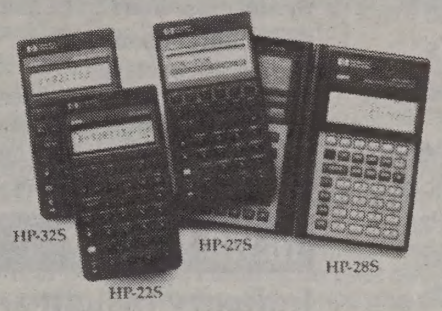

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MICROTIMES™

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A NOTE FROM THE EDITORS

We're very proud to be bringing you this month's cover story, an in-depth interview with John Walker of Autodesk, Part Two of which appears next month. He doesn't do them too often, and, as readers of *The Autodesk File* or the now-famous memo "Autodesk: The Final Days" can attest, he has some interesting insights.

Visionaries, self-appointed or otherwise, are relatively common in this business. Visionaries with a firm grounding in common sense and customer service are a lot more rare. Walker is that and more. We hope you enjoy reading this interview as much as we enjoyed putting it together.

—ME

COVER STORY

Autodesk: The Next Generation
By Mary Eisenhart 52
Cover and contents photos: Michael Jay
Autodesk co-founder, former president and chairman, and current programmer John Walker talks about future technologies, their implications for his company, and the world they'll help create. (Part Two appears next month.)

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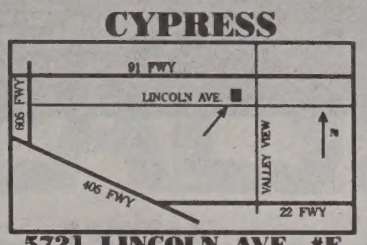

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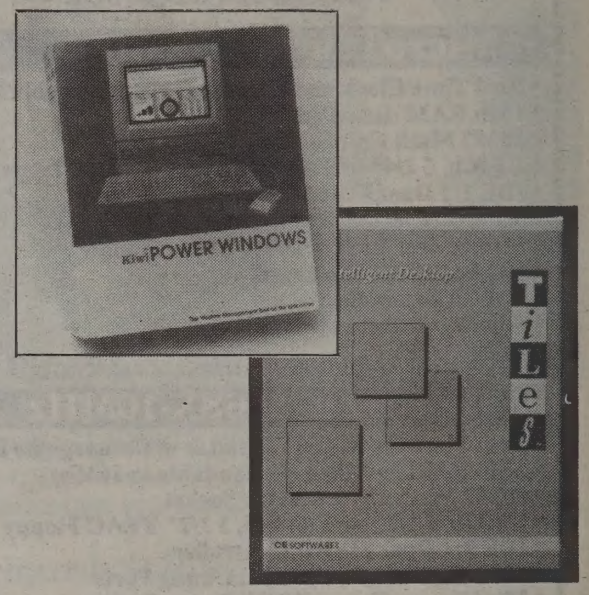

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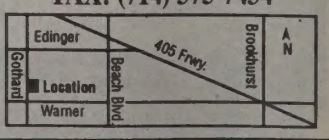

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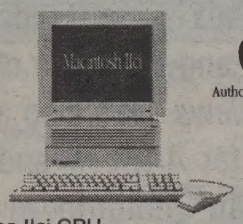

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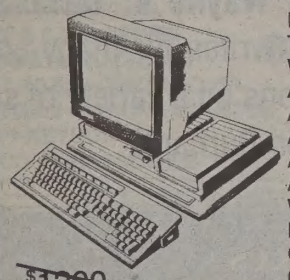

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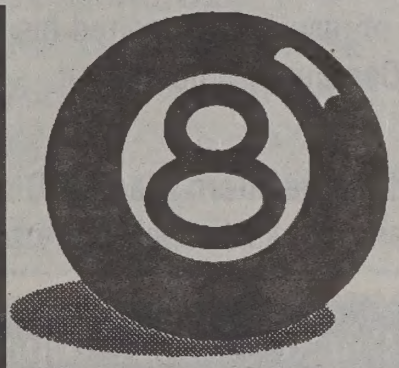

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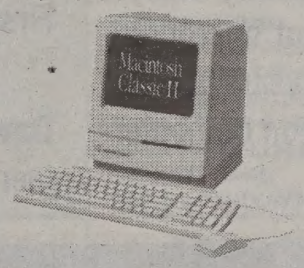

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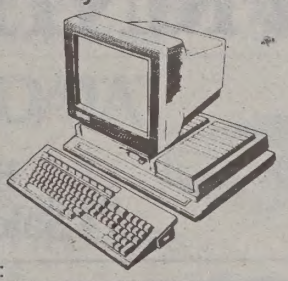

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CONTRIBUTORS

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Jim Warren, a man of many accomplishments in the computer industry over the years, recently chaired the First Conference on Computers, Freedom & Privacy. He also serves on the board of directors of Autodesk.

LAN columnist **Wayne A. Yacco** is a consultant and writes for many computer publications on a variety of subjects. He lives in Burbank.

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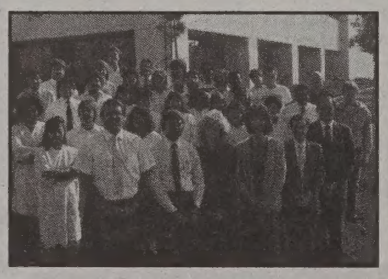

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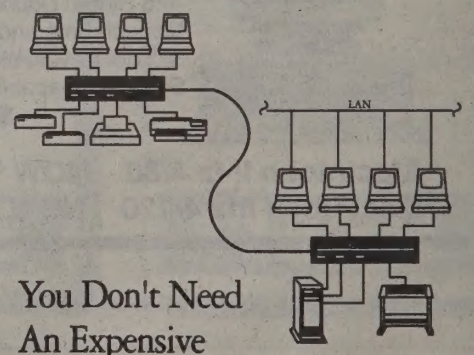

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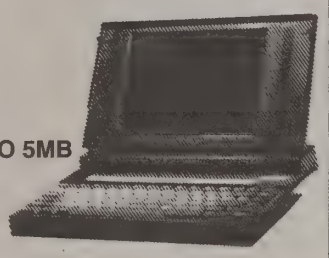

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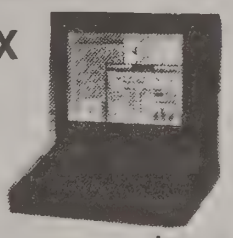

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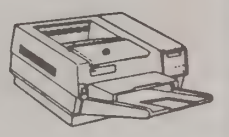

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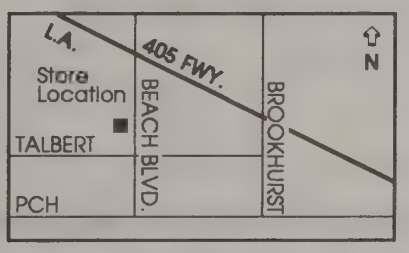

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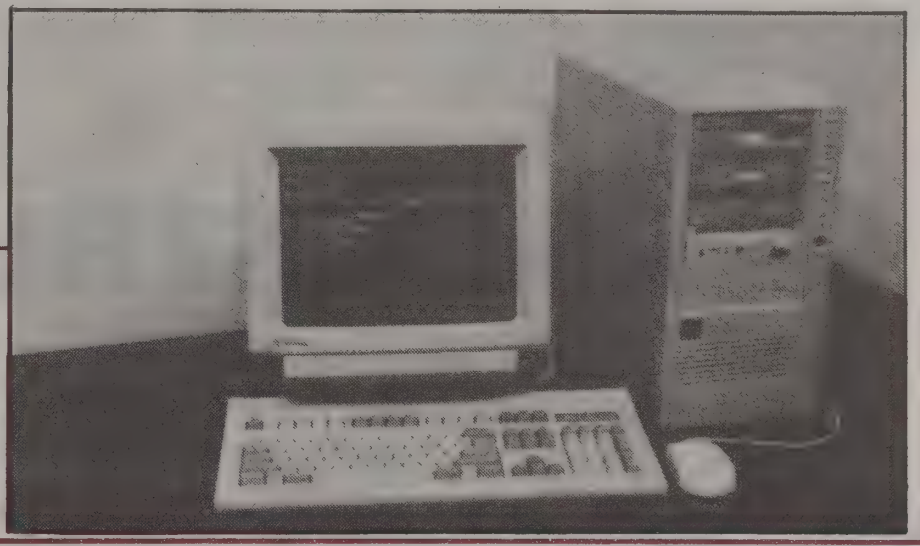

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INDUSTRY INSIGHT

Microsoft Buys Fox, Intel Sues Cyrix, OS Confusion

BY PAUL HOFFMAN

MICROSOFT ENTERS DATABASE MARKET WITH FOX PURCHASE

Borland's recent purchase of Ashton-Tate has spurred Microsoft to buy the next largest PC database company, Fox Software. Although Fox had sales of only 15% of Borland/Ashton-Tate's last year, the purchase gives Microsoft an early entry to support the higher-end packages it expects to introduce in the next two years. The two acquisitions mean that the xBASE market (that is, programs compatible with dBASE III) now has two very large players who enjoy competing with each other on both technology and price.

Microsoft was clearly itching to purchase Fox or one of its competitors like Nantucket. Microsoft will trade stock worth $170 million, or nearly five times Fox's annual revenue, for the privilege of buying the privately held company. At those sums, Fox had better continue its upward trend in sales.

Many analysts feel that Microsoft paid far too much for Fox, given its future prospects. Borland now has a set of database products from the low end to the high end, and will unify them into common language and interfaces within a year, further solidifying Borland's 70% lock on the market. Other analysts point out, however, that Microsoft took on even worse odds against WordPerfect in the word processing market and is making significantly larger inroads every year.

Another advantage of the Fox purchase for Microsoft is that most reviews rate Fox's products much higher than Ashton-Tate's. One of the reason Borland could buy Ashton-Tate at fire sale prices last year was that despite its huge market share, it was consistently losing ground to small companies like Fox. Fox's products, such as FoxPro for MS-DOS, often run two to three times faster than Ashton-Tate's, and have easier-to-use interfaces. But even with worse performance, people bought dBASE products because of the Ashton-Tate name. It remains to be seen if Borland can fix those problems in future releases of the products over the next two years.

It also remains to be seen if Microsoft will screw up the good customer relations that Fox has built up. One of the main reasons Fox could survive at all was its commitment to customer service and to supporting application developers who used FoxBase in their products. Microsoft's record of supporting developers in similar situations is spotty at best. If they take the best parts of Fox (the high-quality software) but change the corporate culture significantly, Microsoft could lose many customers to Borland in the same way that they did with the C compilers. David Fulton, president of Fox, has said that the entire development team is moving to Microsoft headquarters in Washington; he hasn't said what will happen to the marketing and support staffs.

Microsoft's move changes the database market mostly on the low end. Its widely expected Cirrus product will compete more in the middle as a front end for FoxPro and remote databases. Borland and Lotus already have such products, and the market for them is fairly weak. The biggest sales come from the low-end products like dBASE, FoxPro, and Paradox. Microsoft could up the ante by bundling various modules from Fox in its other products, such as its C compiler or Visual Basic, but so can Borland. Microsoft rarely prices its software on the low end of the spectrum, so it can't even start a real price war without being hurt by Borland's normal strategy of winning over converts with special deals.

The most likely result of the purchase is that you'll see more database features in the non-database products from both Microsoft and Borland.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman@well) and MCI Mail (264-3171). He also writes popular microcomputer books.

Many analysts feel that Microsoft paid far too much for Fox, given its future prospects against Borland. Borland now has a set of database products from the low end to the high end, and will unify them into common language and interfaces.

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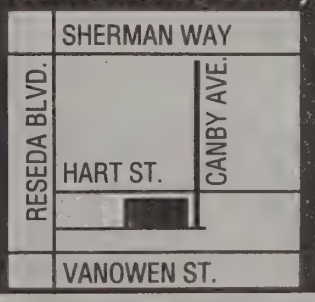

CPU WARS: CYRIX VS. INTEL

Cyrix Corp., best known for its math coprocessors, announced and showed a new chip that will compete with many of Intel's best-selling CPUs. The new Cx486SLC combines the best features of Intel's 486SX with the power-saving features of the 386SLC and puts it in a package that PC manufacturers can use today. Instead of forcing clone makers to redesign their motherboards to accommodate the new chip, Cyrix allows them to simply substitute the new chip for a 25MHz 386SX.

Intel responded as it traditionally does to competitors and sued Cyrix.

The Cx486SLC has an additional feature that took many people by surprise: the price is incredibly low. The chip costs $120 to $130, almost $100 less than Intel's 486SX, while running at approximately the same speed and having power-saving features that Intel's chip lacks. It costs about the same as Intel's 25MHz 386SX but runs 2½ times faster. At the announcement, Zeos, one of the largest mail-order retailers of PCs, announced that it would add systems based on the chip to its line of products within months. Other manufacturers such as Tandon also announced support, and others were seriously considering it for release later this year.

Other than the excellent price, one of the biggest factors affecting the manufacturer's buying decision is the chip's pin-compatibility with Intel's 386SX. With competition getting tighter and the recession affecting all dealers, many manufacturers have been cutting back on their research and design budgets. A chip that can be plopped right into an existing design has a huge advantage over one that takes even a small redesign. Although the market for Intel's 486SX has been small due to its high price, Cyrix is expected to make significant inroads in both desktops and portables.

Now that the 386SX portable market is completely saturated and the 386 portable market will be within a year, manufacturers can leapfrog into the 486SX market easily with the Cyrix chip. The low-power design even lets them reduce the size of the battery, or at least claim longer times between recharging.

Intel's lawsuit against Cyrix claims that Cyrix infringes on four of Intel's patents. Cyrix's main defense is that the chip is actually being manufactured by chip giant Texas Instruments (TI), who has a patent cross-licensing agreement with Intel that could nullify the lawsuit. It is likely that TI will join Cyrix's side in the case, thereby pitting Intel against a company that has had remarkably good luck in patent lawsuits over the last decade. Intel recently sued Chips and Technologies (C&T) for its 386-compatible CPU and TI joined on C&T's side as its foundry, using the same arguments that are expected in the suit against Cyrix.

In the C&T case, Intel asked for a temporary restraining order against C&T, TI asked to intervene, and the judge in that case allowed TI to join. TI argued that it has a broad cross-licensing agreement with Intel and that agreement gives it the right to fabricate the CPUs for C&T.

That line of argument will be tested in a few cases, possibly within the next few months. In the past, Intel has sued Cyrix over patents in Cyrix's math coprocessors. Cyrix says that it is protected by the patent cross-license of its foundry for those coprocessors. That case, plus the two cases in which TI is expected to intervene, may quickly open the CPU market and significantly damage Intel's monopoly on CPUs for PCs.

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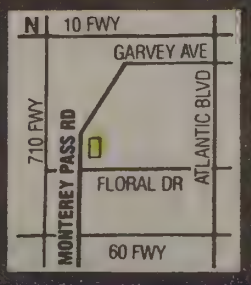

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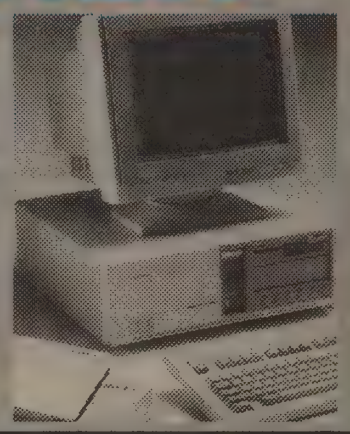

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DEC GETS SERIOUS ABOUT PCS

If you read the trade journals, you can't help but notice that Digital Equipment Corporation (DEC) had jumped into the PC market in a big way, with much more vigor than previous attempts.

In the past few months, DEC has been taking out multi-page ads in most national PC magazines touting its line of higher-priced and powerful PCs. It has also stepped up its telemarketing to its traditional minicomputer clients. The prices offered by DEC are near those of Compaq and Northgate, and are easily beaten by other mail-order manufacturers and most local PC stores.

To bolster its position in the PC market, DEC recently bought Berkeley-based 800 Software, a major software distributor with a large corporate clientele base. 800 Software will continue to operate as it does now but will be a wholly owned subsidiary of DEC. As such, it will allow DEC to offer software and software support to its corporate clients at the same time it offers them deals on its PCs.

DEC says that its new move has increased its market share tenfold. Many more corporations will appreciate a one-stop shopping venue such as DEC, particularly ones who already spend millions of dollars a year on DEC minicomputers. DEC says that it will keep the two hundred employees of 800 Software in their current location and will add much more significant ties to the company.

NEW OPERATING SYSTEMS SHIP—USERS START THIS YEAR'S MUDDLE

Stay with MS-DOS? Upgrade from Windows 3.0 to Windows 3.1? Try out OS/2? The choices have just gotten more difficult with the long-awaited releases of Microsoft's Windows 3.1 and IBM's OS/2 2.0.

Both companies made their self-imposed deadlines of early April after both missing their previous deadlines at the end of last year. COMDEX in Chicago was the first public view of these two competing operating systems, and many people came away feeling that both were worthy of consideration, regardless of the fact that Windows 3.1 will easily outsell OS/2 2.0.

For months, industry pundits have questioned why anyone would want to use OS/2 if Windows 3.1 lived up to expectations. With both systems now available, many are backtracking on their criticism of OS/2 and are praising it for its faster execution of many Windows programs. Windows 3.1 runs faster than v3.0, particularly on systems with slow CPUs and 2MB of memory. OS/2 requires faster CPUs and more RAM for a minimum system, but rewards the user with a more robust and predictable system than Windows 3.1. Many corporate buyers are saying that they will use OS/2 2.0 instead of Windows 3.1, despite the gloom-and-doom in the press, due to its technical superiority.

Many people are also worried about Microsoft's commitment to Windows 3.1 with so much emphasis being put on Windows NT. Windows NT will be a higher-end operating system with many features that will make it far superior to Windows 3.1. In the past, when Microsoft has released such vastly improved products, it has dropped support for the older, weaker versions. Like OS/2 2.0, Windows NT will require a faster CPU and more memory than Windows 3.1 and will offer a more stable system with many advances. Many people who have previewed Windows NT say that it has pretty much the same advantages of OS/2 2.0. Microsoft claims that it will release Windows NT by the end of this year, but beta testers who have tested other Microsoft products are skeptical.

Many people who have previewed Windows NT say that it has pretty much the same advantages of OS/2 2.0.

Where does that leave PC users? Many who have bought Windows 3.0 never use it, or only use it to run one or two Windows programs. Those people probably don't need to upgrade to Windows 3.1 or OS/2 2.0 or Windows NT because their current system works just fine. Intermediate and power users will have the most difficult choices, particularly because all three operating systems run both MS-DOS and Windows programs. If these people are also interested in UNIX, their choices will be made more difficult in the coming months as SunSoft releases Solaris 2.0 for the PC.

The fragmentation in the operating system market may help end-users—after they decide which to buy—because it will force all the manufacturers to include all of the features of each other's products. ■

Technology News From Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

➤**IBM Japan** has secured a $74.6 million order from Sanwa Bank for an overseas operation computer system. Due to begin service in March 1993, the Sanwa "Global System" will include twelve IBM mainframes at six computer centers worldwide, plus 550 RS/6000 workstations and six hundred PS/55s at fifty offices in twenty-seven countries.

➤**Microsoft Japan** has announced plans to ship Windows 3.1 this summer.

➤**ADVANET,** a Tokyo networking company, is shipping the XPASS-MC, an ISDN file transfer device for Macintosh computers. It allows NTT's INS Net64 ISDN service to be used for rapid, accurate transfer of large files such as CAD/CAM images between hosts and online terminals. The device also allows transfer of files in mixed-platform environments.

➤**NCR Japan** is shipping a 32-bit Japanese-language pen-input PC. The NCR 3125 Pen computer runs MS-DOS 5.0 and PenDOS, an operating system developed by US-based Communication Intelligence, and supports the Just Systems ATOK kana-kanji conversion function. Later versions of the hardware will also implement both PenWindows from Microsoft and PenPoint from GO.

Computer Stocks Fall Sharply During Month Ended April 10

It was a brutal month for holders of shares in computer makers as concern over increased competition, decreased earnings, and lackluster economic recovery combined to hammer these shares during the trading session ended April 10. For the period, the MicroTimes Stock Index, which tracks the cumulative performance of the shares in the accompanying index, lost 321.30 points before finally coming to rest at a mark of 3566.89. In other words, the average percentage loss for the shares in our index was a hefty 8.26%.

Nationally the news was slightly better during the period as a late-month cut in interest rates by the Federal Reserve outweighed the effects of a sliding Japanese stock market. For the month, the Standard & Poor's 500 Stock Index lost a scant 0.38% while the Dow Jones Industrial Average gained 0.60% to close at a mark of 3255.37.

Turning to the shares in our index we see that many issues would have been happy with losing only 8.2% as investors reacted sharply to surprising earnings reports, and scaled back earnings predictions.

Digital Equipment, for example, lost $14.63, or a sizable 24.43%, before coming to rest at a 52-week low of $45.25. The decline came after the firm announced third-quarter losses of $2.36 a share, significantly higher than the $1.00 loss analysts had been predicting.

Intel also felt the effects of poor earnings, as well as increased investor nervousness over the company's declining market-share, as its shares fell $12.88 to a closing price of $51.13. During the month, the firm announced first-quarter earnings of $0.86 a share, down from $0.95 during the same period a year ago. Intel cited reserves for patent infringement settlements with Hughes Aircraft and Advanced Micro Devices as the reason for the lower earnings.

Concern over earnings was enough to send Adobe's shares sliding to their lowest point in 52 weeks, as the company's stock price lost $12.13, or 23.32%, before coming to rest at $39.88. The drop came as Wall Street analysts scaled back their earnings estimates for the firm.

Increased competition in the form of Microsoft's acquisition of closely held Fox Software, is the reason most Wall Street analysts cited for downgrading their recommendations on Borland International. Whatever the reason, investors took the recommendations to heart as Borland led all dollar-losers during the period, slipping $15.75 before finally ending matters at a price of $52.00.

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SOFTWARE												
OTC	Adobe	(L)	ADBE	52.00	39.88	-12.13	-23.32	18	0.32	0.80	68.50	39.25
OTC	Aldus	(L)	ALDC	28.00	22.38	-5.63	-20.09	15	0.00	0.00	57.75	21.50
OTC	Autodesk		ACAD	29.75	34.50	4.75	15.97	15	0.48	1.39	62.25	23.25
OTC	Borland		BORL	67.75	52.00	-15.75	-23.25		0.00	0.00	86.75	39.50
OTC	Informix		IFMX	26.00	29.00	3.00	11.54	36	0.00	0.00	33.00	5.25
OTC	Lotus		LOTS	38.63	33.25	-5.38	-13.92	34	0.00	0.00	40.75	18.00
OTC	Microsoft		MSFT	121.00	116.00	-5.00	-4.13	38	0.00	0.00	133.25	60.50
OTC	Novell		NOVL	58.75	54.13	-4.63	-7.87	44	0.00	0.00	65.00	22.63
OTC	Oracle		ORCL	17.00	13.25	-3.75	-22.06	47	0.00	0.00	21.13	7.00
OTC	Software Publishing		SPCO	24.63	18.00	-6.63	-26.90		0.00	0.00	26.25	12.50
OTC	Symantec		SYMC	44.25	43.00	-1.25	-2.82	58	0.00	0.00	51.00	19.50
HARDWARE												
OTC	Apple		AAPL	63.13	55.50	-7.63	-12.08	21	0.48	0.86	70.00	40.25
OTC	AST Research		ASTA	17.25	16.25	-1.00	-5.80	7	0.00	0.00	32.25	14.50
NYS	Commodore		CBU	14.38	13.88	-0.50	-3.48	8	0.00	0.00	20.00	10.13
NYS	Compaq		CPQ	28.75	24.88	-3.88	-13.48	17	0.00	0.00	65.00	22.13
NYS	Digital Equipment	(L)	DEC	59.88	45.25	-14.63	-24.43		0.00	0.00	74.25	45.25
OTC	Dell	(H)	DELL	23.67	25.63	1.96	8.27	18	0.00	0.00	27.34	13.50
NYS	Hewlett-Packard	(H)	HWP	77.38	75.00	-2.38	-3.07	22	0.80	1.07	85.00	44.63
NYS	IBM	(L)	IBM	89.63	86.00	-3.63	-4.04	4.84		5.63	110.75	81.63
NYS	Silicon Graphics		SGI	21.25	18.00	-3.25	-15.29	27	0.00	0.00	29.75	13.25
OTC	Sun Microsystems		SUNW	32.50	27.75	-4.75	-14.62	14	0.00	0.00	38.63	20.75
NYS	Xerox		XRX	75.25	72.25	-3.00	-3.99	18	3.00	4.15	82.25	51.50
NYS	Tandy		TAN	29.75	27.63	-2.13	-7.14	13	0.60	2.17	36.50	23.38
CPUs												
NYS	Advanced Micro Device		AMD	17.88	16.63	-1.25	-6.99	7	0.00	0.00	21.50	8.38
OTC	Intel		INTC	64.00	51.13	-12.88	-20.12	13	0.00	0.00	68.75	38.50
NYS	LSI Logic		LSI	8.00	7.25	-0.75	-9.38	38	0.00	0.00	12.50	6.50
OTC	MIPS		MIPS	13.00	10.63	-2.38	-18.27		0.00	0.00	20.63	7.88
NYS	Motorola		MOT	75.38	74.13	-1.25	-1.66	22	0.76	1.03	82.50	54.00
COMMUNICATIONS												
NYS	AT&T	(H)	T	38.25	41.88	3.63	9.48	107	1.32	3.15	42.13	32.88
NYS	BellSouth Corp.	(L)	BLS	45.38	44.38	-1.00	-2.20	14	2.76	6.22	53.00	43.38
OTC	MCI		MCIC	32.75	31.25	-1.50	-4.58	16	0.10	0.32	36.13	25.25
NYS	Northern Telecom		NT	46.13	44.75	-1.38	-2.98	22	0.32	0.72	49.25	32.50
NYS	Pacific Telesis	(L)	PAC	38.75	38.75	0.00	0.00	15	2.16	5.57	45.00	36.88

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DOW JONES INDUSTRIAL AVERAGE	3235.91	3255.37	19.46	0.60
STANDARD & POOR'S 500 STOCK INDEX	405.84	404.29	-1.55	-0.38
N.Y.S.E. COMPOSITE	224.30	223.27	-1.03	-0.46
NASDAQ COMPOSITE	618.62	584.24	-34.38	-5.56

DATE	MICRO TIMES	DOW JONES
08/29/91	3265.70	3049.64
09/27/91	3216.77	3006.04
10/25/91	3223.68	3004.92
12/12/91	3254.85	2895.13
01/20/92	3961.41	3254.03
02/14/92	3984.10	3245.97
03/13/92	3888.19	3235.91
04/10/92	3566.89	3255.37

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Leading Congressional Candidates Endorse Cyberspace Civil Liberties

BY JIM WARREN

REALIZABLE FANTASIES

This column usually concerns near-future technology—viable possibilities for the next two to five years—enjoyable to write; perhaps entertaining and/or profitable to read.

However, there comes a time to sally forth from our technoids' safe-haven and attend to the larger impacts of our innovations—for we are the ones who understand their double-edged potentials. This is such a time.

A time to Stand Up and Be Counted! Mount the Ramparts! Smite the Wicked! Defend Freedom! Protect Privacy! A gigabit to every door; a palmtop for every hand! (Oops, that's for 1996.)

Copyright © 1992 by Jim Warren, 345 Swett Rd., Woodside, CA 94062; email/jwarren@well.sf.ca.us. All rights reserved. *Jim Warren founded InfoWorld, the DataCast proposal for paperless electronic newspapers, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various computer trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), received one of the first Electronic Frontier Foundation Pioneer Awards (1992), and is a member of the board of directors of Autodesk, Inc.

NOT SINCE GUTENBERG—AND NOT SINCE THE THIRD REICH

Not since backroom printing presses of the revolutionary 1700s has technology offered such powerful tools enabling citizen-based freedom and democracy. This time, the power is via networked personal computers. And, not since Hitler's Third Reich and Stalin's Russia has technology so threatened personal freedom, equitable democracy, and personal privacy.

Which will dominate depends greatly on guaranteeing that 18th century civil liberties—speech, press, assembly, limits on search and seizure, etc.—are protected against technological encroachment in the 20th (and 21st) century.

Various congressional candidates have now made formal, written commitments to specific action to assure that Bill of Rights protections remain invariant regardless of new technologies. [See the March *MicroTimes* for a model candidate's statement to which they responded.]

THESE CANDIDATES COMMITTED TO ELECTRONIC CIVIL LIBERTIES

Do try this in your own home: These congressional candidates (party, listed address, House District) signed the complete model statement:

California Assembly member **Ted Lempert** (D, Redwood City, seeking 14th House seat) was the first major-party candidate to sign and return the model statement [see sidebar], unmodified—within two days of receiving it. And he did more than just "sign up." He faxed a two-page letter detailing various technology/privacy concerns—credit databank errors, consumer tracking, etc.—illustrating unusual awareness of the issues. He concluded his explicit commitments to act, saying, "We need to have the moral resolve of our predecessors to confront the challenges which are before us so that future generations shall have a realistic chance of preserving personal liberties."

San Mateo County Supervisor **Tom Huening** (R, Belmont, 14th House seat) signed two days later, without knowing of Lempert's response. Huening already has backing of the liberal Lincoln Club, Hewlett-Packard founder David Packard, etc.

After two faxes and snailmail, former Assembly member **Dixon Arnett** (R, Palo Alto, 14th), San Mateo County Supervisor **Tom Nolan** (D, Menlo Park, 14th), and Intel staffer **Mike Maibach** (R, Menlo Park, 14th) signed up, within an hour of hearing that this column was "on deadline," and that Lempert and Huening had committed. Arnett added that he was an Assembly cosponsor of California Constitution's Privacy section.

Thus, of those seeking the 14th Congressional seat that I contacted, all of the Republicans and two of the four leading Democrats signed. That San Francisco Peninsula district covers from San Mateo to Cupertino, including much of Silicon Valley.

Then there are the **Libertarians**:

Lots o' Libbies use the computer nets. I sent only one electronic copy to only three local activists—but the Libertarians signed up *en masse!* These included: **June Genis** (Woodside, Senate), **Richard Boddie** (Senate short-seat), **Chuck Olson** (Palo Alto, 14th), **George O'Brien** (12th), **James Elwood** (8th), and even **Alan Barksdale** (Huntsville, **Alabama** 5th) who responded by email. Libertarian state-office signatories included **Will Wohler** (3rd state Senate), **Anton Sherwood** (12th Assembly), **Mark Valverde** (13th Assembly), and **Robert Goodwyn** (Sunnyvale, 22nd Assembly).

Not since backroom printing presses of the revolutionary 1700s has technology offered such powerful tools enabling citizen-based freedom and democracy. And, not since Hitler's Third Reich and Stalin's Russia has technology so threatened personal freedom, equitable democracy, and personal privacy.

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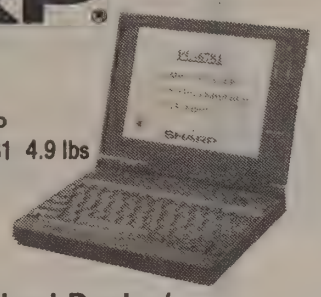

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Sherwood added, "We knew instinctively that we *had* to support [the March *MicroTimes*] proposal. ... Any candidate that thinks this is a non-issue doesn't know history. Each new technology has had to fight for its rights...."

I assumed my original model statement was probably too extreme for serious candidates—why, it was as adamant as the Bill of Rights! So its cover letter asked candidates to merely use it as a starting point. It's reassuring to find that major, electable candidates support it.

THESE CANDIDATES GAVE LIMITED COMMITMENT

Two other candidates—one, the leading Republican contender for the six-year US Senate seat—responded, but did not commit to explicit action (complete copies available):

US Representative **Tom Campbell** (R, Stanford, Senate) said that he "would work to ensure that the freedoms to which we are entitled as American citizens are not whittled away simply because we adopt new technologies...." His statement noted, "A citizen's reasonable expectation of privacy should always be protected," and said, "Within protected zones of privacy, government intrusion must ordinarily be justified by probable cause and judicial discussions," and offered observations about technological threats. Campbell is the most liberal of the three Republican candidates for that seat, is backed by Dave Packard *et al.*, and now serves on the House Science, Space and Technology Committee, among others.

Longtime computer pro **Glenn Tenney** (D, San Mateo, 12th) is opposing incumbent Tom Lantos. He has discussed his candidacy online for several months, and responded by email. Saying he has "for years fought for just such constitutional freedoms," he added, "...my platform notes that we must stop having technology abuse us and having us abuse technology; and that our privacy at home, on the job, and in every aspect of our lives must be protected...." He declined to commit to authoring electronic civlib legislation in his first year, and questioned many of the positions in the model statement, but offered few alternatives.

Citizen Political Action To Protect Electronic Civil Liberties: Update

In March, this column included a "model candidate's statement" that readers could send to their local politicos. I sent copies to the major congressional candidates, locally.

Paraphrasing the Bill of Rights, its signatories would commit to promptly introducing legislation to protect traditional civil liberties against abuses excused by changes in technology. (Copy available upon request; address at end of column.)

It asked that candidates commit to specific action protecting computer-based speech, online press, and teleconferenced assembly, just as the Bill of Rights more clearly protects voice-based and hand-written speech, paper-based publication, and face-to-face assembly. They would defend thousands of non-suspects from search and seizure of confidential files and communications in "electronic post offices" or stored in shared "information vaults"—when a search warrant names only one or two users of such shared systems. Regarding seizure of data while investigating a misdemeanor or other crime, these candidates would limit seizure to the "electronic file cabinet"—disks, diskettes, tapes, etc.—rather than an entire "electronic home or office," e.g. every computer system, telephone, and audiotape player in sight, as has been taken in recent raids. Finally, candidates would remove forfeiture as an incentive to seize computer systems by computer-hungry agencies (alleged in San Mateo County and elsewhere), and stop officials from holding expensive systems as ransom until un-charged suspects forfeit their statutory or constitutional rights and protections (alleged in Santa Clara County and elsewhere).

This May column, the last one before the June primaries, lists candidates who signed the model statement, and those who offered other comments—and those who didn't bother to respond to this constituent and voter request.

After the June primaries trim the field, let's try again. Expect another update in my October column.

THESE DIDN'T RESPOND DESPITE MULTIPLE REQUESTS

In spite of two or three faxes and snailmail in two weeks—all noting that non-respondants would be listed in this column—these 14th District candidates didn't call, write, fax, or respond in any way.

County Supervisor **Anna Eshoo** (D, Atherton, 14th) never responded—unsurprising to my high-tech neighbors and myself, who have clashed with her for years. We opposed her voting herself a 28% pay-raise five weeks after her last run for Congress, and her later advocacy of a $100,000+ "retirement benefit" after three terms. She supported authoritarian building inspectors, door-to-door surveillance, huge county fees, and draconian regulations. Illustrating technical competency, she voted to prohibit homeowners' use of government-approved, code-approved, inexpensive, easy-to-install plastic sewer pipe. Justification: It was a health hazard and might conduct fire. (Honest, it's in the record!) The plumbers' union was pleased. She's the only woman in a field of nine Democrats.

Palo Alto attorney **James Blackman** (D, Palo Alto, 14th) also never responded to multiple requests.

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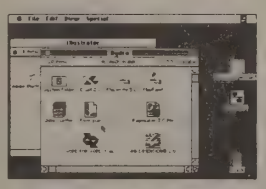

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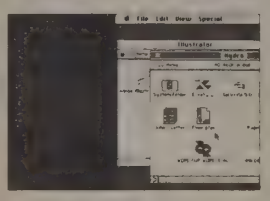

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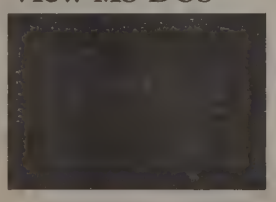

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The Ultimate Portable Note Taker

Info Select Is An Excellent Representative Of A Class Of Software That Helps You Store, Organize, And Find All The Various Notes You Collect Throughout The Day

BY ED KAHN

In the old days, my desk and pockets were cluttered with scraps of paper. I had notes, 3" x 5" cards, business cards, and all kinds of paper litter. Each night, I would gather as much of this mess as I could and add it to the piles already on my desk. Eventually, I would sort through these scraps of paper in the hopes of making some sense out of them. Some would be pasted into my notebook, others would wait on my desk to be examined again in the future. A few would make their way to the waste basket. I always thought there must be a better way to do this. There is and has been for some time.

Several years ago, MicroLogic introduced a program called Tornado Notes. It represented a new class of software that would allow you to enter this conglomerate of information into a computer program and then, miraculously, be able to find the information you needed. MicroLogic now offers Info Select, a new version of the older Tornado Notes. Once again, this is a wonderful addition to any computer, and since it requires relatively little space and is memory resident, it is particularly well suited for portable computers.

When I first discovered Tornado Notes, I used it every day. When, for some unknown reason, I stopped using it, my desktop returned to being cluttered. Now, with this improved program and its new features, I find it indispensable once again.

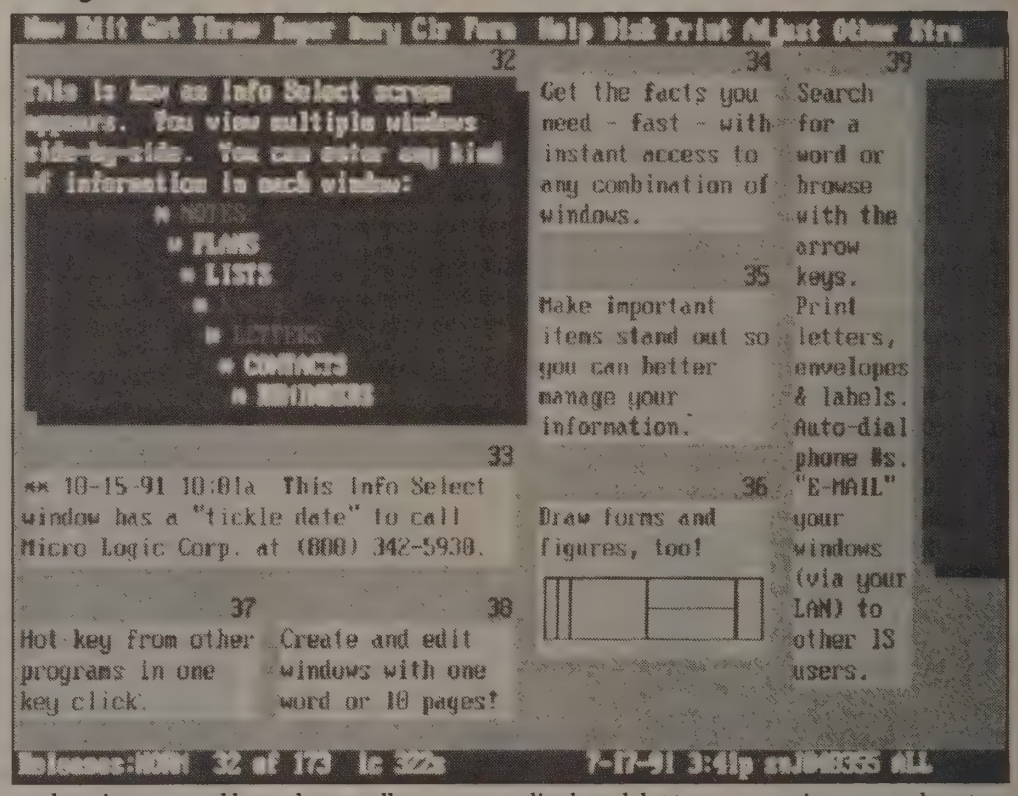
Info Select is well designed, so that with only minimal instruction you can benefit from this program almost immediately. When you load the program into your autoexec file, it will be available to you with the touch of a hot key no matter which program you are in. So, if you are working on a report and are interrupted by a phone call, you can call up Info Select by pressing "Alt J." On-screen you will see several small windows, each containing a note or piece of information you have entered into the program. Type "N" and a blank window will instantly appear so you can enter new information. Info Select is convenient for short entries like names, phone numbers, directions, product names—almost anything that formerly went on those little scraps of paper.

As soon as you have completed an entry, simply hit the escape key a couple of times and the window will be saved. To access information, you can browse through the windows that appear alongside each other on the screen. Using the arrow keys moves you between windows. Having multiple windows displayed lets you examine several notes simultaneously.

Although this program is simple in concept, it is quite sophisticated. Information retrieval, for one thing, is almost instantaneous. And no matter how many notes you have, it is easy to locate the one you need—either by remembering when you made it, what it says, or where in the stack of notes it resides. If you need a particular note often, you can shift it to the top of a pile. It is also equally easy to print a note or erase it from a stack.

If you have notes on different subjects, you can create different stacks. For instance, if you keep notes for your business, you might want to set up a business stack as well as a personal stack of notes. You can set up as

Continued on page 122


32
34
39
This is how an Info Select screen appears. You view multiple windows side-by-side. You can enter any kind of information in each window:
PLANS
LISTS
35
Make important items stand out so you can better manage your information.
Search for a word or browse with the arrow keys.
Print letters, envelopes & labels. Auto-dial phone #s.
"E-MAIL" your windows (via your LAN) to other IS users.
33
** 10-15-91 10:01a This Info Select window has a "tickle date" to call Micro Logic Corp. at (800) 342-5930.
36
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37
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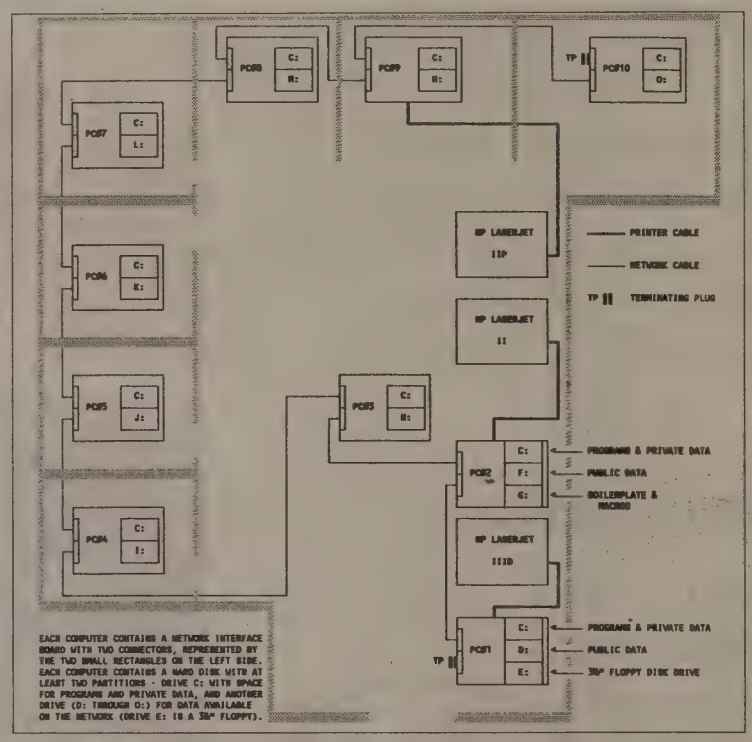
Small Businesses Connect With Peer-To-Peer Networks

Smaller Offices Are Discovering The Benefits From These Lower Cost, Easier To Manage Alternatives To Client-Server Networks

BY MARV DOWNEY

The proliferation of microcomputers brought a tremendous potential for increased efficiency throughout the business community. More recently, local area networks (LANs) have become a central element for the fuller utilization of this technology—both the hardware and software. Sharing printers, modems, programs, and documents between computers throughout a business can make everyone's job easier and more efficient. Accompanying these benefits, however, have been concerns about the cost as well as difficulty of installation and maintenance of a LAN. These concerns can easily discourage new users, especially small businesses.

A rapidly growing number of small organizations, however, are discovering and proving that networks do not need to be expensive or difficult to install and maintain to be useful.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The hard disk on each computer at Charles Bailey & Assoc. is partitioned with space for programs and private data on one side and data available to everyone on its peer-to-peer network.

CONNECTING EVERYONE IN A SMALL OFFICE

The collection of computer equipment at Charles Bailey & Associates, a San Francisco real estate appraisal and consulting organization, like many small businesses, consists of a variety of products from an array of vendors. In the early 1980s, the bulk of their computer technology consisted of a Wang minicomputer with terminals for word processing by the clerical staff. Eventually, this system was also used to make some crude financial projections. As the decade progressed, computers were used for more tasks by more people, including the appraisers. Word processing and spreadsheets often provided the hook that introduced everyone in the office to PCs.

In late 1984, a local consultant brought an IBM PC with Lotus 1-2-3 into Bailey's office. "Suddenly work that would take hours on an HP calculator could be done in minutes, and you could afford the time to test many more assumptions," remembers Steve Radcliffe, an appraiser already familiar with microcomputers from using an Apple II for word processing at a previous job. Soon other appraisers were vying for time on the single IBM PC, which of course, eventually crashed in the middle of a big project.

Most of the appraisers realized that handwriting and/or dictating a report that would be word processed by someone else was unnecessarily cumbersome and mistake-prone. About this time, computers began appearing on most of the desks in the office. As appraisers began typing more of their work, floppy disks were used to transfer the reports to the clerical staff for final preparation and printing.

This process worked smoothly until the arrival of Lori Kaplowitz, the new office manager. She had come from an environment that had a Novell network. Even though she vividly remembered all of the problems with the network, she also knew the potential benefits that a LAN offered. These advantages include reducing the number of different versions of a document on different disks; a storage facility for common, frequently used text (also referred to as a boilerplate), macros, and spreadsheet templates; and the ability to share laser printers. Wary of the complexity and cost of Novell, she suggested they look into a low-cost alternative—a peer-to-peer network.

PEER-TO-PEER ALTERNATIVES

Peer-to-peer refers to a network that is not dependent on a single, large central server computer dedicated to running a complex non-DOS operating system, such as a Novell network. Peer-to-peer network software commonly runs as an add-in with standard MS- or PC-DOS and allows computers on the network to share disk drives and peripherals.

Charles Bailey & Associates chose the LANtastic network from Artisoft to connect their ten desktop computers plus three HP LaserJet printers. The hard disk on each

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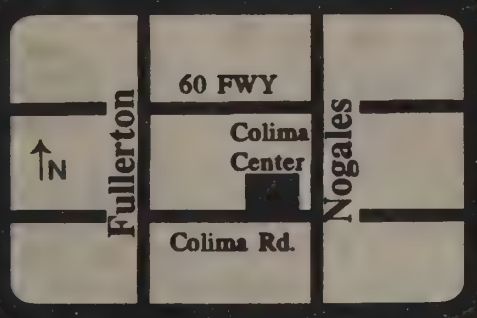

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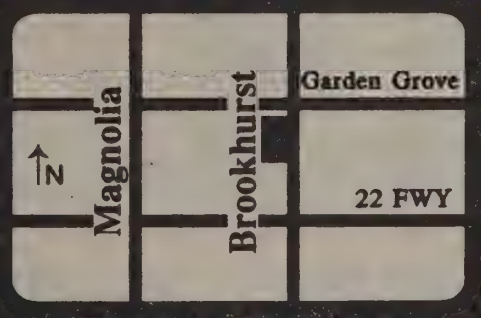

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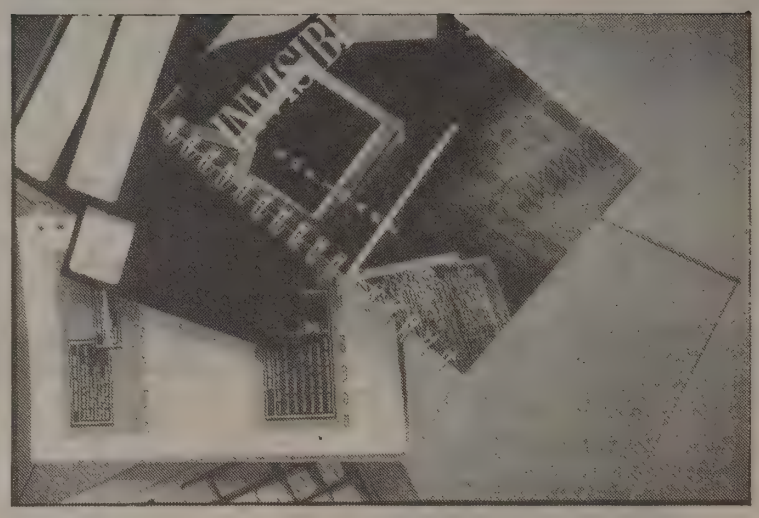
computer was split into two partitions. The first partition (drive C:) contains the programs each user needs and space for storing private files. This partition is not available on the network. The second partition, assigned a different letter on each machine, is available from any other computer on the network. The whole network thus looks identical from each computer: a drive C: with programs and each user's private files, and drives E: through O: representing drives available across the network. The only difference between computers is that default drives for sharing data are set to match the drive letter of the second partition on that particular computer. The main computer system for the clerical staff is equipped with a larger hard disk that has a third partition to store office-wide word processing macros and boilerplate text. Thus, any user can access this data, and create, save, and revise reports onto their hard disk.

The clerical staff now has access to these draft reports without the need to pass floppy disks around the office. Printing can also be done from any PC at any time. "The main benefit for me," says Steve, "is the ability to pull information from the boilerplate area or out of old reports from any computer on the network, whether or not the appraiser who created it is even here. That, and access to the laser printers from my office, makes life much easier."



The Invisible Network, from Invisible Software, offers one of the fastest peer-to-peer networks available today.

After the successful acceptance of this peer-to-peer network by everyone in the office for word processing and spreadsheets, Charles Bailey & Associates added an office-wide contact management program called ACT!, from Contact Software International. ACT! provides a simple, centralized contact list accessible from all of the company's computers.

A tape backup unit is attached to the main clerical computer system. With the peer-to-peer arrangement, any hard disk can be backed up from a single tape drive. LANtastic even allows for a floppy disk drive to be a network drive. Thus, the solitary 3.5" floppy disk drive in the office was assigned a letter on the network, allowing anyone with data on a 3.5" disk to access it from their computer.

This ability to locate printers easily throughout the network is another advantage of the peer-to-peer arrangement. The faster, full-featured LaserJet IIID printer is used primarily by the clerical staff for fin-

Continued on page 126

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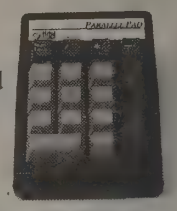

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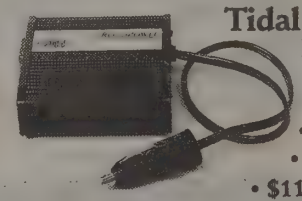

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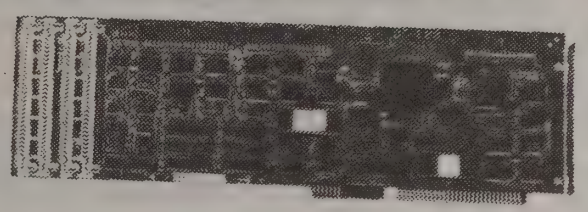

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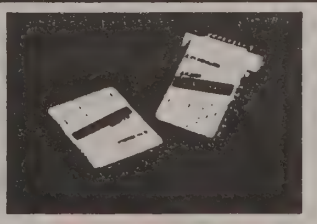

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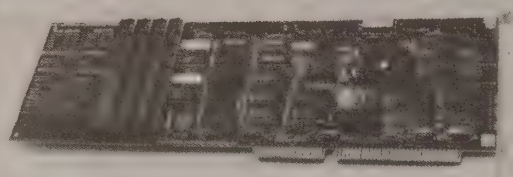

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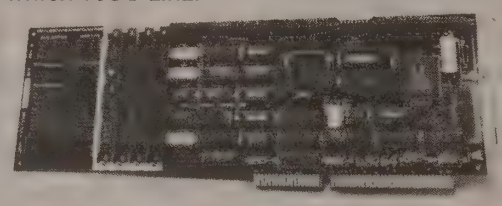

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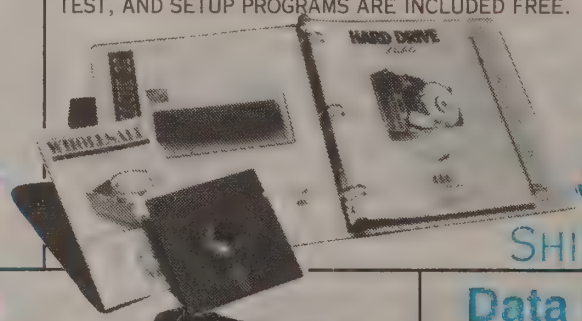

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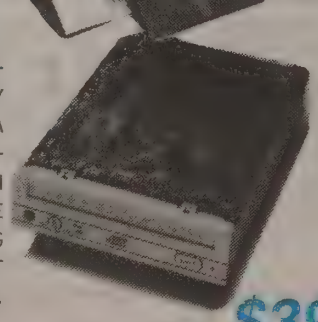

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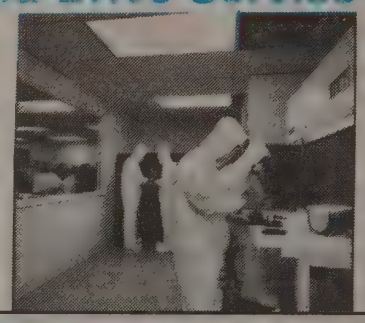

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Building A Hybrid Network With 10BaseT

Part 1

BY WAYNE A. YACCO

The evolution of Ethernet has been from thick to thin to unshielded twisted pair (UTP). If you've been considering twisted-pair Ethernet (TPE, aka 10BaseT), the good news is that you don't have to scrap your network and start over. Consider a hybrid system. You can preserve your investment, and take advantage of TPE's benefits at the same time, by combining different types of cabling with special converters and concentrators.

A hybrid system has no disadvantage compared to a purebred one, and there are advantages to incorporating UTP in your network. First, UTP is the easiest and least expensive cable to install. You can often use existing telephone pairs. It's almost idiot-proof: There's no bus cable to break or terminators to remove. Its star topology is also more reliable than a thick or thin bus topology, because each node constitutes an independent segment. If a segment fails, the rest of the nodes are unaffected. Also, prices for 10BaseT NICs and concentrators are falling to the point where it's getting easier to justify TPE even when installation and cable costs aren't significant.

The one thing lacking in TPE is the longer distances supported by thick or thin backbones, but there are ways around that limitation with cascaded concentrators, repeaters, and bridges. For example, it's easy to connect a small department's thinnet backbone to a 10BaseT hub or to another thinnet backbone using TPE.

Copyright © 1992 by Wayne A. Yacco. All rights reserved. *An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at PO Box 269, Burbank, CA 91503.*

CONNECTING BACKBONES TO HUBS

You can connect a thinnet backbone to a 10BaseT network by putting an inexpensive concentrator (or hub) in a computer and cascading it to the central concentrator in your wiring closet. Most of these internal hubs either have the BNC connector you need for a thinnet backbone, or offer it as an option. Once a thinnet backbone is connected to a local hub, it can become part of the network in the wiring closet through a single UTP drop.

The smallest possible hub has an advantage in this application, because you don't have to pay for a lot of RJ-45 ports that you don't need. Pivotal pioneered low-cost concentrators with its first 4-port hub a little over a year ago. It has a BNC connector built right into it, and the company also offers an expansible 12-port version. Now Artisoft, D-Link, MiLAN, and others also make 4- to 12-port hubs—many with expansion modules—that plug into a PC's bus.

Artisoft's PeerHub is an example that uses an optional interface kit, based on the company's AE-3 NIC, to provide either a BNC or AUI port. The kit connects to the hub via a special internal AUI port, leaving all of the hub's five external ports free. (Of course, the host computer is also connected to this backbone by the AE-3.) Alternatively, either of two internal UTP ports on the hub can be used to directly connect just the host computer to the network using a similar internal UTP port found on Artisoft's family of AE-1, AE-2, and AE-3 Ethernet NICs. Both internal UTP ports can also be used together to cascade up to four Peer-Hubs. And because these hubs include firmware, you can create a 20-port concentrator in a passive backplane (without a CPU).

At least one internal hub, D-Link's DE-205TP Hub Ethernet Adapter, has a network controller built into it. It frees a slot, and saves the cost of a separate NIC for the machine where the hub is installed. Moreover, it supports both NetBIOS and IPX for use with NetWare, SCO UNIX, Sun PC-NFS, NDIS (LANmanager, Banyan Vines, DECnet Pathworks), ODI, and Nexos.

CONNECTING BACKBONES TO BACKBONES

Similarly, these inexpensive hubs can connect two thinnet segments. Just connect one

A useful strategy, when several machines are together in a close group, is to connect them with thinnet, and then connect that bus to UTP without a hub. This is what Apple and Taligent are doing for some of their power developers who use several machines on a single desk.

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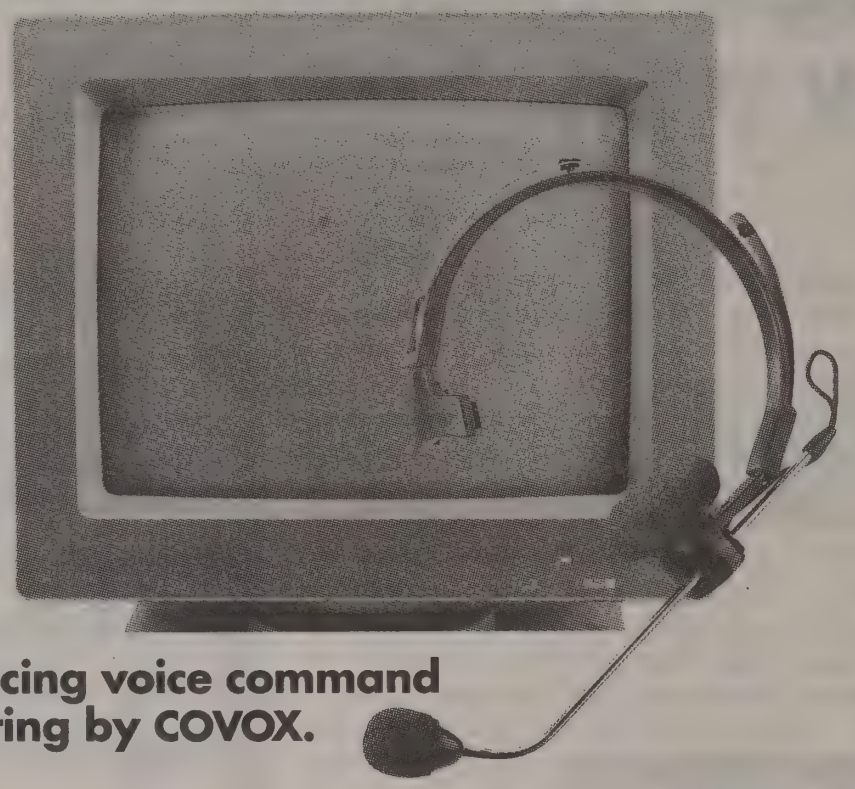

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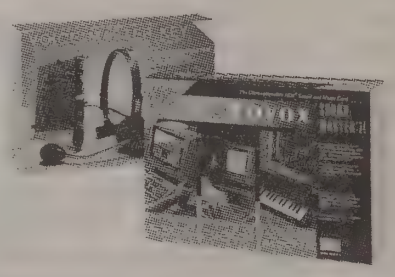

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A hybrid system has no disadvantage compared to a purebred one, and there are advantages to incorporating unshielded twisted pair in your network.

hub to each of the backbones, and cascade the hubs with a single UTP segment. (A crossover cable will usually be required for hub-to-hub connections).

USING TRANSCEIVERS TO CONVERT AUI PORTS TO 10BASET

If you want to connect NICs using their AUI ports, there are external transceivers that will get you directly into 10BaseT. Farallon and MiLAN Technology both have adapters that will turn an AUI port directly into a 10BaseT transceiver.

Naturally, Farallon's PhoneNET StarConnector EN is also available in a model that converts Apple's 14-pin Ethernet connector to twisted pair. MiLAN, too, offers a second flavor of AUI converter in addition to its MicroTwist. Its Micro-Mau converts an AUI port into a thinnet transceiver. (MiLAN also makes transceivers that connect to thicknet through N-type connectors or vampire taps.) Both the Farallon and MiLAN units have status lamps for power, link, send, receive, and collision on their converters. They both have switchable SQE heartbeats too. So, they can be used with SQE on, to connect hubs to NICs, or with SQE off, to cascade hubs or connect them to repeaters or routers.

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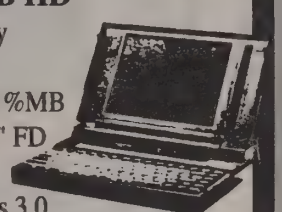

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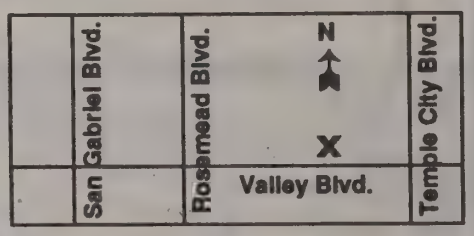

also solve that problem by concentrating a number of UTP segments, and repeating them over a single drop to the wiring closet.

However, if you don't need to include a local backbone, Shiva's 5-port Hublet can be a better choice than an internal hub. It's specially designed to concentrate a small group of outlying segments on a single drop. Up to four nodes (or segments) can be connected to the Hublet, and still leave a port for cascading. The fifth port is already wired to cascade, and doesn't need a crossover cable. (If you want to use the Hublet as a 5-port hub for a small network, then you'll need a crossover cable to turn the cascade port into an input.) And you can cascade Hublets to concentrate more than four segments on a UTP drop.

CHEATING

There's another trick that can solve the single-drop dilemma too: going the other way, and adding thinnet to a 10BaseT network. While you can cascade concentrators to increase the number of segments on a UTP drop, the retiming circuits in those devices impose a significant limit on how many of them can connect to your network.

Therefore, a useful strategy, when several machines are together in a close group, is to connect them with thinnet, and then connect that bus to UTP without a hub. This is what Apple and Taligent are doing for some of their power developers who use several machines on a single desk. Next month, I'll get into the reasons behind hub and repeater limits and tell you about MiLAN's Alternet, the device Apple and Taligent—as well as Borland, HP, and others—are using to connect thinnet and UTP segments without retiming.

CASTING BREAD UPON THE WATER

In a recent column, I raved about a couple of new Goldstein and Blair books for the Mac. I suspect that somebody at M&T Books is spying on this column, because Margaret Garcia-Boesch sent me a couple of unsolicited titles. I'm glad she did. *Building Local Area Networks* (Patrick Corrigan and Aisling Guy) and *The NetWare Decoder* (Ellen Thro) are just terrific.

Building covers just about everything you need to know about networks. From photos of punch-down tools and wiring blocks, to tips on installing Netware 2.2 and 3.11, the authors have it all. It's a practical consultant on a shelf, and I suspect it's going to result in a few less billable hours. It's even got a glossary of terms.

But if you want a truly encyclopedic compendium of network glosses, turn to Thro.

Thro's book is not your average Ovaltine decoder. She's put together a reference that would give Carson and McMahon hours of material. You know the routine: "Everything you ever wanted..." Not just terms, but NetWare commands are included. I've seen a lot of computer dictionaries over the years, but when I used them for reference, most fell short. I guarantee you, you'll find *The NetWare Decoder* on my bookshelf. Captain Midnight would have been proud. ■

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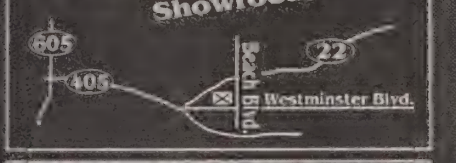

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Further Musings On UNIX Mail

Do You Have To Sell Your Soul Just To Keep From Shooting Yourself In The Foot?

BY BENNETT FALK

UNIX

Things have changed.

Several months ago this space lamented the clunkiness of UNIX mail. The standard UNIX mail utility works perfectly well if you don't get many messages and if you can respond to messages as you receive them.

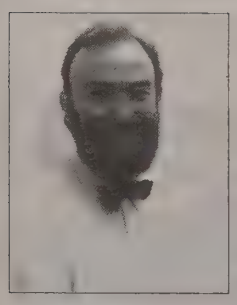
However, working with UNIX mail becomes unbearably awkward if you receive more than fifty mail messages daily and if the perfect response doesn't occur to you when you first read a message. Messages begin to accumulate in your system mail box, and as the list of unanswered messages grows, it becomes more difficult to process newly arrived mail.

For whatever reason, complaining about UNIX mail touched a more responsive chord among readers than any other column to appear in this space over the last six years. Many readers sent electronic mail, some to commiserate, some to share their favorite remedies for an all-too-common problem, and some to gloat that in sending a response they had made the burden of mail even more onerous.

Reading the responses, two things became readily apparent. First, compared with the mail my correspondents receive, the volume of mail I get each day is small potatoes: a busy system administrator may field more than two hundred messages in a day. In addition, none of the people who responded thought the standard UNIX mail program was adequate to handle this volume of mail.

And of course, there were recommendations. Various readers suggested alternative mail handling programs: "deliver," "mm," "MH," "mush," "ELM," and "PDM." These mail handlers are readily available to sites with access to USENET. Several readers proposed filtering incoming messages with ".forward" files to route the mail by various criteria.

The unfortunate thing about all these recommendations is that they required learning how to use yet another piece of software. Properly done, the learning process takes time, and in the short, dark days at the end of 1991, it seemed there wasn't time enough to read mail, let alone time to read documentation for a number of alternate mail handling programs. I persisted in using standard UNIX mail armed only with a few tricks to weed out obviously irrelevant messages.



Copyright © 1992 by Bennett Falk. All rights reserved. *Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed are his own.*

A WINDOW OPENS

And then someone at work spoke highly (the word "spiffy" was used) of the mail tool packaged with OpenWindows from Sun. I was skeptical; the original Sunview mail tool is not a piece of software of which I am fond. The OpenWindows mail tool was indeed something different, however, and when it also turned out that OpenWindows was available on my workstation, I decided to check it out.

OpenWindows is Sun's product to bridge the cultural gap between Sunview (Sun's old, proprietary windowing interface) and more modern GUIs like Xwindows. OpenWindows is designed to allow Sunview and Xwindows applications to coexist peacefully on the same desktop.

The decision to try OpenWindows was not particularly rational; it was based chiefly on the assumption that OpenWindows would behave a lot like Xwindows and that I would be able to use the mail tool without reading the documentation. Any temptation to read the manual was eliminated when none of my coworkers could say where the manuals were, or which documentation might be of interest to the neophyte desiring only to replicate an existing Xwindows setup and read mail more efficiently.

It took about an hour of fiddling to adapt the Xwindows configuration files I use to OpenWindows. Once the windowing system started, I set right to work reading mail.

A busy system administrator may field more than two hundred messages in a day. None of the people I heard from thought the standard UNIX mail program was adequate to handle this volume of mail.

Even without documentation describing the use of the mail tool (I have since discovered the man page for it), I went through about fifty messages in the first session of mail-reading, taking only one-third of the time usually required.

When the time savings persisted over several weeks, it became important to figure out why this tool was so much better a vehicle for looking at mail.

THE OPENWINDOWS MAIL TOOL

On closer inspection, I discovered that the OpenWindows mail tool is not really an alternate mail handler at all; it simply provides a more convenient interface for using standard UNIX mail in a windowing environment.

It was something of a revelation that "user interface" had anything

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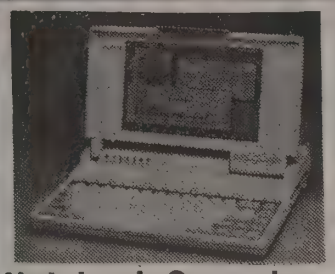

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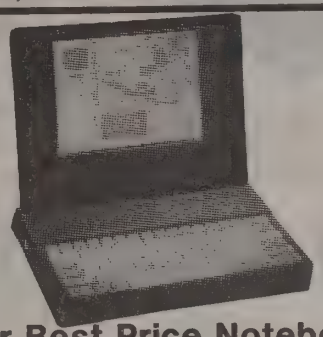

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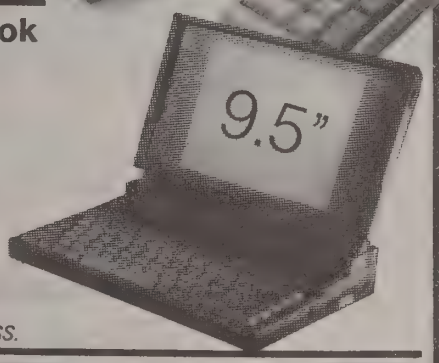

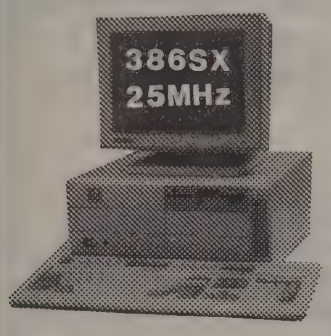

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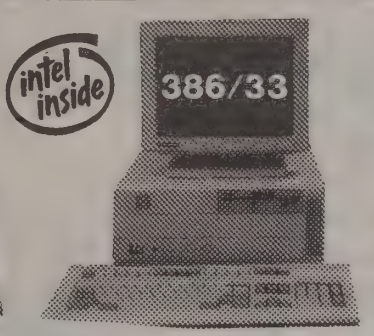

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- 64K high speed Cache memory
- 4MB RAM, expandable to 16MB
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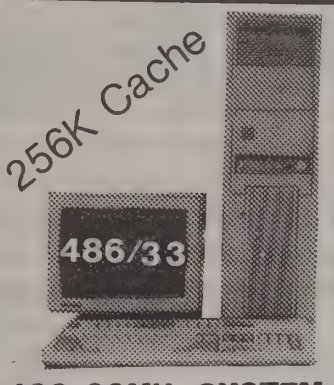

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- Intel 486DX-33MHz CPU
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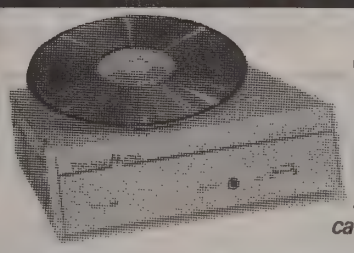

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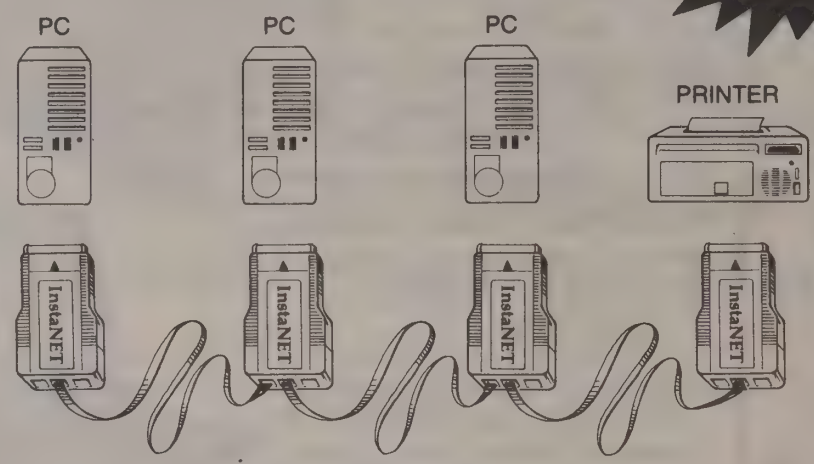

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to do with the "mail problem." The assumption that the UNIX mail handler was inefficient because it lacked features was naive: the inefficiency could as easily be attributed to the single-threaded organization of features: UNIX mail is designed for a user sitting at a character-based terminal, and it forces the user to do one thing at a time.

A windowing mail handler on a workstation does not have to be limited in this way. The OpenWindows mail tool really *is* spiffy. The user may move freely from task to task, without having to complete one thing before starting another. Message headers can be scanned in one window, message text can be read in another, and outbound mail can be composed in any number of independent windows. (The mail tool provided by Sun is not the only mail program available for a windowing environment, the "MH" program recommended by several readers also exists in an Xwindows version.)

GREAT, BUT NOT PERFECT

After a few weeks, the euphoria over being able to read mail without fear began to wear off. Interestingly, achieving a reasonable user interface does not guarantee a product that is feature-rich in other respects.

In spite of the increased efficiency it offers, the OpenWindows mail tool has some feature deficiencies. It doesn't display folders and sub-directories of folders easily; it isn't particularly useful for working with groups of messages; and I have yet to figure out how to make vi the editor of choice for composing new mail messages.

In addition, the whole strategy of changing windowing systems just to get at a mail tool you can use without reading the manual is questionable at best. There are those who think user interface preferences are a matter of religious conviction, and taking up OpenWindows for the sake of the mail tool must look to them like selling your soul to keep from shooting yourself in the foot.

Religious beliefs aside, OpenWindows is also a resource-intensive system, and since I've converted to it, performance on my modestly configured workstation occasionally degrades unacceptably, and the operating system regularly bumps into the limits of its configuration. It is unsettling to discover that you have more than one foot in which to shoot yourself.

Still, it takes less time to read mail now, and it's just possible that I might be able to buy my soul back if I spend the free time virtuously. ■

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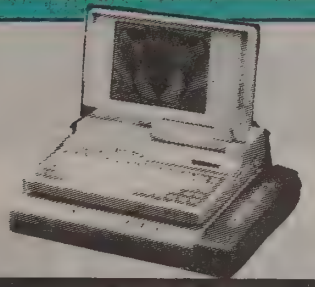

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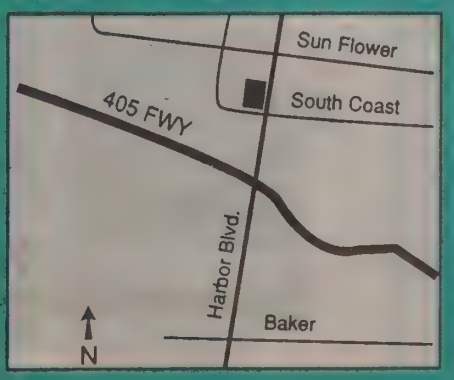

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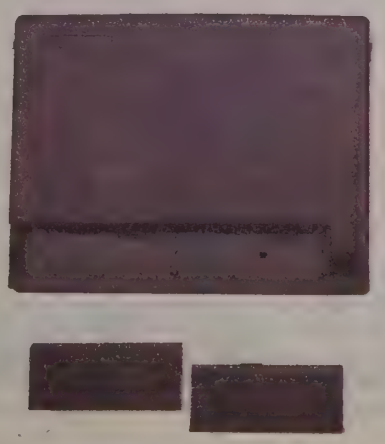

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MONDAY, APRIL 27		CONFERENCE					
	TIMES	PRE-CONFERENCE TUTORIALS					
	9:00am-5:00pm	(M1) The Management Challenge of Downsizing *Theodore Klein*			(M2) Downsizing: Economics, Technology, and Migration Strategies *Allan Levy*		
TUESDAY, APRIL 28	8:30am-10:00am	**(K1) Keynote Address:** Downsizing Applications to LANs: A Management Framework. *Theodore Klein*					
	10:15am-11:15am	**(T1)** Downsizing: Its Promise & Practice *Allan Levy*	**(T2)** Downsizing: Using Technology to Do More with Less *Larry Runge*	**(T3)** Critical Factors in Migrating from Mainframe to LANs *Ronald Peri*	**(T4)** Upsizing or Downsizing *Francis Dzubeck*	**(T5)** Downsizing DB2 Applications *Howard Fosdick*	**(T6)** Re-Engineering the Organization Using GUIs *Steve Garfein*
	11:30am-12:15pm	**(K2) Keynote Address:** Promise of Client/Server and Network Computing *Jack Blount*			**(K3) Keynote Address:** Rightsizing: Myth or Reality? *Robert McDowell*		
	12:15pm	EXHIBITS OPEN					
	1:30pm-2:15pm	PRODUCT EDUCATION WORKSHOPS ■ EXHIBITS					
	2:30pm-3:30pm	**(T7)** Making Your Business Case *Rebecca Bailin*	**(T8)** Downsizing with UNIX *Jean Throckmorton*	**(T9)** Choosing a PC LAN Operating System *Howard Marks*	**(T10)** Enterprise Modeling *Steven Spewak*	**(T11)** Distributing Data, Downsizing, and Open Systems *Herb Edelstein*	**(T12)** Making Large-Scale Windows Application Viable *Paul Bassett*
	4:00pm-5:00pm	**(T13) Panel Discussion:** Downsizing: The CIO Perspective *Marcia Blumenthal*			**(T14) Panel Discussion:** Data Base Administration with Client/Server Equipment. *John Barry*		
	5:00pm-6:00pm	WELCOME RECEPTION					
WEDNESDAY, APRIL 29	9:00am-9:45am	**(K4) Keynote Address:** Downsizing What Already Exists *Dominique Laborde*			**(K5) Keynote Address:** Application Migration to the PC Environment *Paul Burkett*		
	9:45am	EXHIBITS OPEN					
	10:30am-11:30am	**(W1)** The Real Cost of Downsizing *Jerrold Grochow*	**(W2)** Downsize Upmanship *Ronald Bushner*	**(W3)** User Views on Downsizing *John Gallant*	**(W4)** Client/Server Transaction Processing *Dennis McEvoy*	**(W5)** SQL and Systems Development *John Celko*	**(W6)** Graphical User Interfaces in the '90s *John Dunkle*
	11:45am-12:30pm	**(K6) Keynote Address:** Re-Engineering Corporate Computing: An Industry User View *William Raduchel*			**(K7) Keynote Address:** Client/Server Computing in the '90s *Lucy Baney*		
	12:30pm-1:30pm	EXHIBITS					
	1:30pm-2:15pm	PRODUCT EDUCATION WORKSHOPS ■ EXHIBITS					
	2:30pm-3:30pm	RECEPTION					
	3:15pm-4:15pm	**(W7)** Rightsizing the Accounting Department *Doug Potter*	**(W8)** Rightsizing: It's Not Just for Computers Anymore *Richard L. Kolbe*	**(W9)** The LAN's Role in Cooperative Processing *John Dunkle*	**(W10)** Rightsizing: Planning Today's Environment *Doug Kaewert*	**(W11)** Monitoring Your Software Resources *Ken Wasch*	**(W12)** The Role of X Windows *Gary Bean*
	4:30pm-5:30pm	**(K8) Keynote Address:** Open System Standards: Opening New Dimensions in Rightsizing *Ziya Aral*			**(W13) Panel Discussion:** The Network Infrastructure: Defining User Access to Data *Timothy O'Brien*		
THURSDAY, APRIL 30	9:00am-9:45am	**(K9) Keynote Address:** Networking and Downsizing Technologies *David Connor*			**(K10) Keynote Address:** Outsourcing: The Path to Network-Based Computing *Paul Cosgrave*		
	10:00am-11:15am	**(Th1)** Rightsizing and Business Process Design *John Sifonis*	**(Th2)** Downsizing Data Processing *Daryl Tanner*	**(Th2.01)** Downsizing the Mainframe *Andrei Chiovis*	**(Th3)** The Advanced Computing Environment *Scott McGregor*	**(Th4)** Client/ Server Market Update *Cheryl Currid*	**(Th5)** Rightsizing for Increased Productivity *Bruce Golden*	**(Th6)** Effective GUI Design & Standards *Christine Comaford*
	11:15am-12:30pm	BREAK					
	12:30pm-1:45pm	**(Th7)** Downsizing: Reconciling the Management Gap *Andrei Chiovis*	**(Th8)** SQL Server in the Real World *W.B. Soper*	**(Th9)** Network Management for Cooperative Process'g *Tom Kieffer*	**(Th10)** Building a Client/Server Environment *Richard Finkelstein*	**(Th11)** Mainframes & PCs Collide *George White*	
	2:00pm-3:00pm	**(K11) Keynote Address:** Information Architectures for the 90's: Sysyem Designs for the Downsized Environment *William Zachmann*					
FRI, MAY 1		POST-CONFERENCE TUTORIALS					
	9:00am-5:00pm	(F1) Organizing MIS for Downsizing: The LAN Approach *Cheryl Currid*			(F2) Network Computing Systems Management *Tom Kieffer*		

EXHIBITS OPEN 12:15-6:00PM

EXHIBITS OPEN 9:45AM-4:00PM

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Autodesk: The Next Generation

An Interview With John Walker

BY MARY EISENHART

Look around this room. Other than people and plants, this room and everything in it was designed and manufactured. Today, despite all our progress in computing, the process of architectural and engineering design and manufacturing is done much as it was fifty years ago. All of this is about to change.

In the largest companies, you can see glimpses of it already, but, as with the first computers, the benefits have not yet entered the mainstream of the economy. That is the work before us.

The basic trend that drives this industry—the fact that every eighteen months the computer power available at constant price doubles—continues intact and may even be accelerating.

Soon, millions of designers around the world will possess the tools that empower them to design the products of the next millenium. In the United States alone, there are more than six hundred thousand manufacturing organizations. Eighty-five percent employ ten people or less. The revolution in design and manufacturing that is about to occur will change the way we conceive and construct every artifact of humanity.

This is not a small market, or one in danger of "saturation." Its size is constrained not by economic forces so much as the availability of computer power and the creativity of the human mind. The first is growing exponentially with no end in sight. The second knows no bounds.

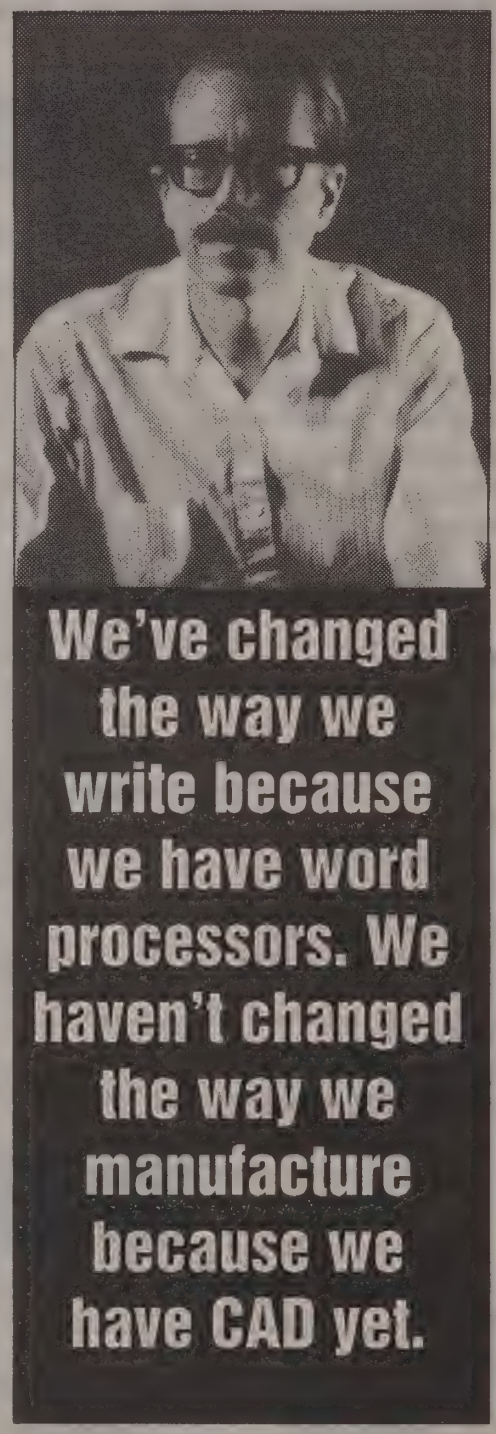
—John Walker, Remarks for the Windows Press Conference, March 10, 1992

"Should I sing the Mel Brooks Inquisition Song now?"

John Walker looks on with horror as the equipment cases disgorge cameras, lights, and other instruments of torture, clearly destined to be used on him. It is perfectly obvious that when he turned the presidency and chairmanship of Autodesk over to Alvar Green some years back, this was the exact sort of thing he was really looking forward to avoiding.

What Walker likes is some peace and quiet in which to write code, something that falls within his job description as programmer at Autodesk's European technical center in Neuchatel, Switzerland. He is, by general agreement, one of the best programmers alive today, to the great benefit of the company's product line. But for the last six months or so, peace, quiet, and Switzerland have not figured prominently in his life.

PHOTO: MICHAEL JAY


We've changed the way we write because we have word processors. We haven't changed the way we manufacture because we have CAD yet.

It all started with Information Letter #14.

Information Letters are a fine old Autodesk tradition. The first twelve (there is no #9) appear in *The Autodesk File,* a collection of internal documents Walker assembled and published in 1988. Most of them were written in the first year of the company's history, as Walker and his fifteen cofounders (who all, as Walker said, would rather write a book than talk on the phone for ten minutes) kept each other informed through startup and success. Eventually they became company-wide bulletins. IL13 contains Walker's thoughts on leaving the chairmanship and returning to programming, along with reflections on the company's future.

While "explaining Autodesk" is one of those endeavors absolutely guaranteed to lead to catastrophic oversimplification, *The Autodesk File* (1988, New Riders Publishing, ISBN 0-934035-63-6) is as good an introduction as you're likely to get, and reveals an ethos as deep, complex, elusive—and strongly held by its founders and employees—as The HP Way at Hewlett-Packard.

In "The New Technological Corporation," a 1988 paper in which he suggests that Autodesk represents a new type of business and discusses the strategic implications of that fact, Walker illustrates a point with the following quote:

"Every heat engineer knows he can design his heat engine reliably and accurately on the foundation of the second law [of thermodynamics]. Run alongside one of the molecules, however, and ask what it thinks of the second law. It will laugh at us. It never heard of the second law. It does what it wants. At the same time, a collection of billions upon billions of such molecules obeys the second law with all the accuracy one could want."

—John Archibald Wheeler

Walker was talking about economics at the time. However, it isn't completely inaccurate to perceive Autodesk as an ordered universe of some very independent-minded molecules, either.

A conscious goal of the founders, aside from taking advantage of the software opportunities generated by the PC market, was to create the kind of company they

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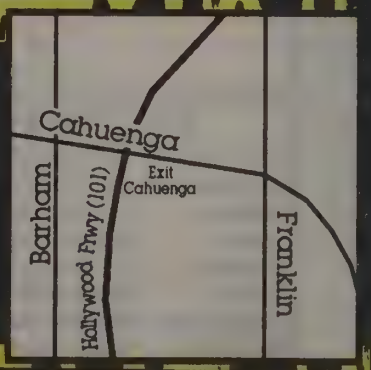

We have a tendency in this business to view competition as some kind of a zero sum game. It's not a zero sum game at all. This industry didn't exist in 1976. It all came from nowhere. And a lot of additional things are going to come from nowhere over the next three years, five years, ten years.

wanted to work at. Many of them still do, and founder/programmers Dan Drake and Greg Lutz serve on the board of directors. As a 1986 recruiting ad said, "We couldn't find a company like this one four years ago, so we built one to our specs. Maybe they'll be your specs too."

But the creative freedom dear to the hearts of hackers was balanced by a lot of common-sense pragmatism. As Walker says, "Any business that isn't interested in meeting the needs of people in the real world is somebody's personal playpen and not a business. You've got to be customer-oriented. Every business is a service business. I believe that firmly, that fundamentally when you ask somebody to give you money, you have to be giving that person something that is more valuable to them than money."

Back in 1982, the founders had no clear idea of the company's direction, beyond the knowledge that they were going to write and sell software. They prepared five prototype products, including an office-automation program called Autodesk, a database based on the public-domain JPLDIS language that's the foundation of dBASE—and a rewrite of a drawing program called Interact, written by founder Mike Riddle. They called it MicroCAD and took a demo to the 1982 West Coast Computer Faire. It was a hit. They put all their resources behind it. They renamed it again—AutoCAD.

AutoCAD, for the first time, made it possible to do computer-aided design and drafting on a personal computer. Since this was previously the exclusive and expensive province of mainframes, it created a sizable market. The company grew and prospered.

By 1986 Walker decided the company needed his programming skill more than it needed him as an administrator, and passed the presidency to Alvar Green. A couple years later, he also resigned as chairman, the better to develop software in peace. In 1990, he moved to Europe.

In 1988, the company was involved in developing a wide range of projects, including Ted Nelson's Xanadu hypertext publishing system, a virtual reality interface called Cyberspace, a molecular modeling package called HyperChem, and an online information system called American Information Exchange (AMIX), in addition to ongoing work on AutoCAD and its many enhancements. By 1991, the company was still prosperous, but funding for most of these projects was gutted, employees were leaving, customers were complaining, and analysts were questioning the company's long-term viability.

Which brings us to Information Letter #14, better known as "Autodesk: The Final Days." On April 1 of last year, Walker distributed IL14 throughout the company's electronic mail system. For good measure, he left paper copies on a few well-chosen chairs.

"In the early days of Autodesk," he writes, "I wrote status reports on the progress of the company for employees and shareholders (who were, at the time, the same people). These papers chronicled the triumphs and disappointments, the crises and their resolutions, which are part and parcel of building a company. It's been years since I brought my view of the company to you in this way; since I removed myself from management in 1988 I've been concerned primarily with software development and identifying technical directions in which the company should move, not commenting on where it was going or how effectively it was getting there.

"But now I feel compelled to speak out. I believe that our company is entering a time of great peril combined with unparalleled opportunity. Regrettably, I do not believe that Autodesk's management is positioning the company to emerge from this period stronger and better equipped for future growth. Indeed, it is my opinion that their current policies place at risk everything we have achieved since 1982."

Information Letter #14 became one of the most-discussed documents in the history of the personal computer industry. Its most famous section described a nightmare scenario in which Microsoft's Bill Gates decides to go into the CAD business and ships a slick, state-of-the-art, Windows-capable package that completely outclasses the Windows-incapable AutoCAD. (The document received even wider circulation when Gates quoted from it in his own much-leaked internal memo "Challenges and Strategy" the next month.)

Information Letter #14 paints a dire picture of projects derailed by lack of investment (in one instance, Walker points out, Autodesk finally decided to spend some money on advertising a new product after he volunteered, in exasperation, to buy the ads with his own money), with much ensuing brain drain to rival firms, low morale among the developers who remained, and customer dissatisfaction at slow response to their changing needs. It characterizes the flagship product as outmoded (a features comparison with CorelDRAW! is especially scathing) and overpriced. It concludes with a rousing call to action:

"If this message is understood and accepted, then the next few weeks should bring the first signs of change. In a few months, the first evidence of the new Autodesk will begin to appear on the marketplace. Things will start to get better. It will be obvious to everybody that Autodesk is again on the move, that the spirit, the confidence, and the energy that vaulted Autodesk into the front ranks of software companies in 1983 and 1984 is now, in the early years of this new decade, carrying Autodesk further, toward leadership among the next generation of software companies.

"If management does not act, this too will become obvious. It will be reflected in falling sales, declining profits, eroding market share, and eclipse of the company as an industry leader—loss of the ineffable sense that here is where the future is being built. If this happens, we will know what opportunities were squandered at the very moment Autodesk held the future in its hands, and we shall never forget."

The last few months suggest that Autodesk is coming out of the doldrums. Walker returned from Switzerland for a six-month visit, assuming the temporary title of manager of technology and taking an active part in the search for a new CEO/chairman to replace the retiring Green. In the spring, back-to-back rollouts of AutoCAD Extensions For Windows and the molecular modeling package HyperChem took place amid assurances that over two dozen more products, including the long-deferred Cyberspace and AMIX, would appear before year's end.

As we go to press, Autodesk has just announced the appointment of Carol Bartz, a vice president from Sun Microsystems, as Autodesk's new CEO and chairman. Walker is back in Switzerland, where we'll probably be hearing more from him. For one thing, he's got another book on the way: *The Hacker's Diet: How to Lose Weight and Hair Through Stress and Poor Nutrition.*

At the press conference, Walker professed himself well pleased with the arrival of Bartz and the company's state as it entered its second decade. "These are not our final days," he said. "This will be our finest hour."

This interview took place about two weeks earlier.

We've seen it before. How can you talk seriously about selling tens of millions of Pascal compilers and C compilers? Nobody wants to be a programmer! And yet people have bought tens of millions of Pascal and C compilers, and it's changed the world. Because anybody can program now. And look at all the software that's been created by these people.

It would be more standard, at this point in a company's evolution, for somebody in your situation to have washed their hands of it and walked away. You seem to be doing rather the opposite—while not being chairman, not being president, and categorically denying that you're calling the shots, you nonetheless seem to have a pretty strong interest in Autodesk's direction. Why are you doing this, instead of going back to Switzerland and doing something else?

Well, I guess you have to ask the question "Why do people wash their hands of companies?" If you get fired, that's a pretty straightforward case. There's the case where you conclude that "the company wants to go this way, I want to go that way."

Those are all things that I've certainly thought of many times. I'm always constantly reevaluating everything.

Basically, where Autodesk should be going is where I want to go personally. And as long as I can persuade Autodesk to go in that direction, I consider that my efforts are more useful, more effective, leveraged by having the resources of a company like Autodesk going my way, than they would be off by myself in my pump factory in Switzerland.

What I intend to spend the next five years of my life doing is working on automated manufacturing. I'm certainly planning to be doing that in my capacity as a programmer at the European technical center of Autodesk. If Autodesk recruits a new CEO, and the CEO's first act is to fire me, I'm going to spend the next five years of my life automating manufacturing anyway, okay?

It's what I want to do, and I believe it's the most important thing I could do for Autodesk. And that whether I do it or not, it is something that Autodesk has to do if Autodesk wishes to remain the strong force in the CAD business that it now is, because that's part of where the CAD business is going.

Coming over here entailed sacrificing a large amount of what I've spent the last five years of my life trying to achieve, in terms of having a low profile, in terms of not being identified with the company. Throwing that away, I've lost a large part of my life, and it's not clear that it's retrievable, at least not without another four or five years. I guess that's an indication of how much I believe in what we're doing here, in what we're attempting to do, and how much I believe I could contribute to achieving that.

You've defined what you think Autodesk should be doing. What other likely directions do you see for it?

I think you have to take an appropriately long view of the context we operate in. We are in several businesses, which I don't think you could find any competent thinker who would not believe are going to grow very, very rapidly over the next twenty, thirty, fifty years. If you are in a business like that, then you have to be a competitor who is constantly concerned about how much of that business is yours.

I believe that however you define market share, having the largest market share in the CAD business is an asset that is measured in the hundreds of billions of dollars over the next fifty years. I believe that having a commanding market share in desktop video is an asset that will be worth hundreds of billions of dollars over the next fifty years. Similarly you can just line these things up.

Now if a company focuses too much on the short term, on the margins this quarter, the margins over the next year, and sacrifices market share, that's a bad business decision. That is squandering an asset of the company for a near-term benefit. That's not in the long-term survival interest of the company.

I think we have a tendency in this business—perhaps it's educated in business schools—to view competition as some kind of a zero sum game. It's not a zero sum game at all. This industry didn't exist in 1976. It all came from nowhere. And a lot of additional things are going to come from nowhere over the next three years, five years, ten years.

When you have a success, it's easy to assume that 1) it can go on forever, and 2) that that's all you need to do. I look at Autodesk, and I look at our rate of growth, and I look at Microsoft's rate of growth. I look at Borland's rate of growth. I look at the other players in this business, and I prefer not to think of it as a predator/prey relationship, but rather colonies of bacteria in a Petri dish. If one is growing at 75% a year, and the other is growing at 15% a year, then before long you tend to end up with all of #1. Not that #1 even bothers to devour #2, but rather that #2 is sufficiently irrelevant now that it just doesn't matter.

That's what really happened with Autodesk in competing with the major mainframe CAD vendors for the drafting market. We didn't really take seats away from them—most of the companies that had those mainframe systems still have them, in fact have more of them. What happened was, we created an entirely new market for CAD that was the other 98% of the business they weren't selling to, and that's where the growth came from.

I believe that that's what you have to do. I think it's crazy to say that the CAD market as it exists today is all there's going to be in CAD. In the *really* long term there isn't going to be drafting. But I think getting rid of it is going to take a lot longer than a lot of people believe.

It's a highly effective form of communication. It's a form of communication that is so evolved after thousands of years that it challenges the designer of the CAD system to better it. I can literally get a napkin, and about that fast, make a drawing that I can hand to a machinist who can hand me a part, with tolerances of a thousandth of an inch, to my specifications. Block, circle, just draw the dimensions; it doesn't have to be precise—that person will manufacture it for me. If I were to sit down today using the best solid modeling systems in the world, it would take me a comparable amount of time to build a model of that object as it takes the machinist to make it. Now if I'm the designer, which am I going to use? If I can scribble down a couple of lines and give it to some guy, and he goes off and does it, why should I manufacture the part myself so that now it can be manufactured?

That's the challenge we have. We've changed the way we write because we have word processors. We haven't changed the way we manufacture because we have CAD yet. That's not going to happen in five years. It's going to start to happen in five years. In isolated places you can see it now. In the very high-end military systems they're building fully faithful 3-D models of the objects before they're ever assembled, they're doing automated manufacturing takeoff from these models, and on a project the scale of the B-2, they save money doing it. But for that technology to filter down to the machine shops, most of which are very small and don't have a large capital budget, is going to take a long time. And it's going to take pushing.

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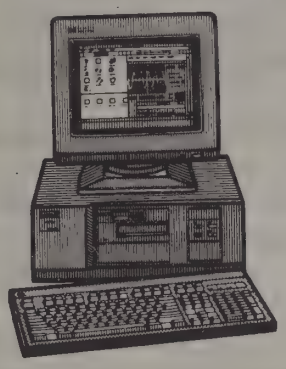

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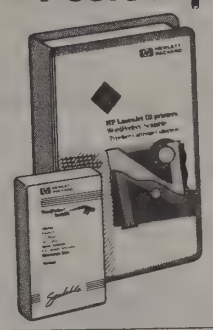

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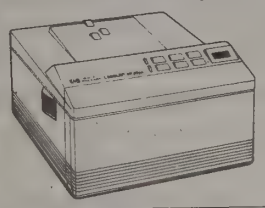

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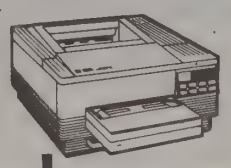

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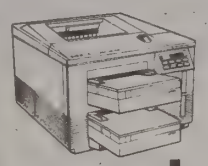

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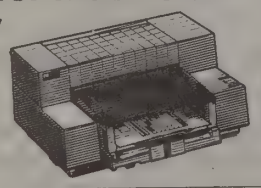

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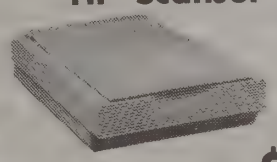

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Once something is in the box, the software will appear. People will start to use it. And I think we're really getting to that point on the hardware you need for desktop video now.

Those were the very people who, twenty years ago, were putting in CAD systems for drafting. So that's the filtering-down process, and I don't mean filtering down passively, I mean people like Autodesk pushing that technology out into the world, and creating opportunity for these people. Because it's fundamentally an issue of productivity gain. It's productivity gain, and that's survival in the manufacturing business.

Is this one of the areas where the Cyberspace project would tie in?

It's central to why I encouraged Autodesk to start the Cyberspace project.

I recognize that all kinds of people say different things about this. To me, Cyberspace isn't William Gibson's vision, it isn't the global net. When I use the word, I'm simply talking about a 3-D user interface. That is all I'm talking about when I use the word.

One of the things I wanted us to do two years ago, and maybe when we get the product finished we'll actually be able to do, is to have the world's first Cyberspace race. Take a simple mechanical part, like a universal joint for example—two U's and a couple of pins—and set up three workstations, as they were, side by side. One has a very conventional 3-D CAD system with a tablet interface and a flat screen. The other has a nice shaded 3-D fast rendering engine on a flat screen, and a dial box and various things you use in high-end mechanical CAD. And the third has the Cyberspace station, whatever technology we're using. The guy fires the starting gun, and three people, from all the parts of this thing, assemble it in space, which is basically positioning operations. Position this so it aligns with this, put this piece in here. This is something you can do on any CAD system in the world.

If we've got Cyberspace right, the guy with the Cyberspace rig is going to be able to do it in about ten seconds. It doesn't take long to put a U-joint together—you just pick it up and, *whoosh*, you're done. With a great graphical user interface—click, drag, position, pull down menu, dialog box, drag, align—it's ten times longer. And if you're working on a tablet with a 2-D, you're typing in all these numbers and angles and aligning this and verifying that, and looking at it from a different angle...

That seemed to me to be the big win in Cyberspace. To me, the relationship between Cyberspace and CAD was the same as between drafting CAD and high-performance graphics. In the early days of the graphics business, back when we had Adage displays and huge Tektronix storage tubes and other things that cost large amounts of money, they were bought by the very first high-end CAD users. Because as expensive as graphics were in those days, there was a clear productivity gain in doing CAD with graphics over doing CAD without graphics.

Similarly, I think the early adopters of Cyberspace are going to be people doing 3-D modeling and 3-D positioning. And ranging all over the design spectrum, certainly not just mechanical; architectural walkthroughs are an obvious application. Really, across all of 3-D design. That's an application that can really bootstrap this hardware to the point that it becomes accessible for lots of other people.

Time has proven me wrong, by the way. That's why I thought virtual reality was going to happen in 1988, and a lot of other people were saying "No, it's entertainment that's going to push it out first." And entertainment has. There's much more VR hardware both being developed and being used in entertainment applications than in design at this point.

I guess one could also say that the VR hardware we have is so bad that a designer can't really use it now, and that's part of the problem.

It's like, you can play a game with a Nintendo, but you need better resolution than that if you're going to do serious design. And I guess we're kind of at the Nintendo level.

If you're manufacturing sensitive parts, Nintendo is not what you need.

Right. And it's also a question of how complicated things can be. A 12, 15, 35MB CAD database is large, but not huge. Designs are very, very complicated things. The CAD user always wants to have more and more speed and complexity, simply because they don't want to have fifty separate models that are subassemblies, they'd like to have it all in one faithful model.

So the CAD user is always trying to get more CPU power, more graphics resolution, more speed, simply because of the productivity win of being able to get larger models in there. When you start talking about VR hardware that can't track in real time when you have two thousand polygons—two thousand polygons is *nothing* in the CAD business. We're talking millions. Tens of millions.

Where does multimedia segue into all this? Where do sound and motion become important?

Well, I never thought of sound and motion as media. I don't use the M-word. I prefer to describe what we do in our division that bears the M-word as desktop video.

I think desktop video is a huge business—again, one of those businesses that nobody is going to take seriously until the hardware appears that really does the job. And when the hardware appears, it is going to be *so obvious* that it's going to change the world. Vast amounts of money are going to be made, people are going to do things in different ways, people are going to learn new skills.

Today we're really at the Altair level of desktop video, just about. The hardware is something that an enthusiast can get very excited about, and with a vast amount of suffering can do amazingly impressive things—if you're another enthusiast.

We all remember back in 1976—"Wow! Look! It plays Tic-Tac-Toe!" "Wow! It computes the first eight digits of pi in six hours! That's really cool, isn't it?" "Yeah, yeah, that's cool!" [*laughs*] It took a while, and everybody who "got it," to use Ted Nelson's phrase, understood that in five years these things were going to completely change the world.

But that [*laughs*] took a lot of imagination. You had to be plugged in to what had been done on the high end, to see the potential, and you had to believe in something that I think for a lot of people is very difficult to believe in.

There aren't many times in human history that you can draw a straight line on semi-log paper over forty years, and have that trend continue. If you talk to people in a normal business and say, "Well, okay, yeah, a car today goes 55 miles an hour, but in ten years it's going to go half the speed of light," they kind of say, "What are you *talking* about?" But here we say, "Well, yeah, sure, we design something assuming everybody's going to have 32MB in their PC in three years." I have 32MB in my PC *today*, and it cost me less than my Altair.

It's really mind-boggling. And if you really accept that, you can buy into technologies that today don't look terribly promising at first glance.

How big is the market for desktop video? Well, how many camcorders are there out there? You own a camcorder for what, an hour, before you realize, "Gee, it'd be really nice to be able to edit this stuff." "How do I do that?" "Well, you can't." "What do you mean I

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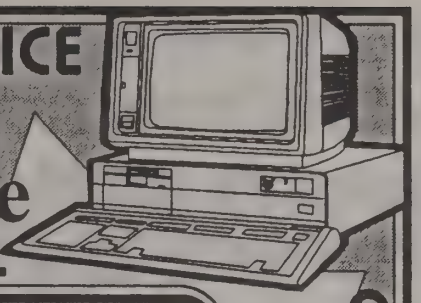

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can't?" "Well, you can buy all this special hardware and it still doesn't work." "Why can't I just do that on my PC?"

Well, why can't you, after all? You can go to Ted's houseboat and use his Aavid system. Clearly everybody's going to be able to do that on their PC. The Aavid's a Macintosh, after all, with some special hardware in it. That technology is going to be everywhere.

When you make a technology like that available, you can't expect suddenly to have everybody start using it. You sell the technology, and every trained animator in the world buys it. Okay, well that's a hundred and fifty. What about the next million? Well, you've got to get it into the schools, you've got to get books written about it, you've got to show people what they can do with it. You've got to give them something to start with so they aren't faced with a blank sheet of paper. After all, you tend to start with a coloring book rather than a notepad, and that's a lot of what we have to do to get it primed.

But in the long term, how can it *not* be something huge?

But I don't think there's going to be a multimedia market any more than there's going to be a graphics market. In the '60s and early '70s, there was the computer graphics industry. Analysts would tell you how much market share each of the players had in the computer graphics industry—Adage and Sanders and all these people were out there, Tektronix owned a huge piece, CalComp owned a huge piece with their plotters.

There isn't any computer graphics industry any more. It's gone. It's in the box. Plug in the PC, and there's graphics. If it doesn't have graphics, it will in a year. So there's no graphics industry. Those people that sold that stuff in the graphics industry, for the most part, are still around, selling what's now the high-end stuff. But that's not the graphics industry. Graphics is part of the PC.

How many years is it going to be? Every PC is going be able to read and write sound and read and write video. It's not going to be as useful if it doesn't have that capability. And I think we're really there. Every Macintosh has had sound since Day One, and I think really every Windows machine is going to have sound very soon, except in large corporate applications or something like that. It's just a matter of time before the chip's on the motherboard.

We spent the first three years around here trying to convince people in this grand and glorious world that you needed a floating point coprocessor. We used to have a version of AutoCAD that ran without the floating point coprocessor, for longer than I either remember or would like to tell you. You plug in the coprocessor, and the product runs five times faster. Not until the 486 was floating point a standard part of the microprocessor—and what's the first thing they did? Take it out! Make a 486SX that doesn't have floating point, and then sell you this floating point that's the whole chip! It's crazy!

We saw that with floating point. We've seen it with graphics being in the box. From the very early days, we sold very well on machines that came with graphics. For the first year of Autodesk, Victor 9000 outsold IBM, because the Victor 9000 came with 800 x 400 graphics right out of the box.

Once something is in the box, the software will appear. People will start to use it. And I think we're really getting to that point on the hardware you need for desktop video now.

We're going to get sound hardware on the motherboard, I expect, within the next generation of motherboards. We're what, maybe two or three years from having the JPEG chip as a standard component. All these little pieces have to come together. But they clearly will.

One of the things we actually did market research on was what percentage of people who own a camcorder own a PC. And it's a huge percentage. If you told people that you could do useful editing, useful production titling, with your PC, a large number of people would, and that's a number in the tens of millions.

There's this feeling that all the money in multimedia is going to be made in titles, in CD-ROMs. I'm not sure that's true. I think we may be trying to apply the TV model of the passive receiver of information, to something that's a creative medium. I'm sure it'll exist, but I'm a lot more interested in getting the creative tools out into as many hands as possible, because I think that's going to cause this upwelling of software.

We've seen it before. How can you talk seriously about selling tens of millions of Pascal compilers and C compilers? Nobody wants to be a programmer! And yet people have bought tens of millions of Pascal and C compilers, and it's changed the world. Because anybody can program now. You don't have to work for a big company and do what they say. And look at all the software that's been created by these people.

That's what we need to do with these video communication tools. And we're just at the beginning of a terribly long cycle here.

Do you see that dovetailing with CAD at any point?

Again, I think the CAD user will be the early adopter of many of these technologies. We're seeing it already. Clearly, architectural walkthroughs are a major application of 3D Studio. Product illustrations, product concepts, are places that CAD and multimedia/desktop video fit together very well.

To get very far with this stuff, you've got to understand 3-D modeling. And there aren't a lot of people in the world who understand 3-D modeling, except CAD users. You don't have to bootstrap them up through the whole concept of building models, thinking in 3-D, working in 3-D, handling lights, handling rendering. They already know that. They're doing it. So to a CAD user, you're simply saying, "All you're really doing is adding motion and dynamics" to something they already understand.

If you're talking to somebody who watches MTV and would like to do stuff like that at home, you have a much longer learning curve.

Clearly the people that first bought PCs were people that already used computers at work. It took a while to broaden out. But it's inevitable that it will.

You've said something I thought was intriguing—that there's a perception that CAD is a vertical nichey market, but that after all, there was a time ten years ago when spreadsheets were considered a vertical nichey market. How do you see the analogous transformation taking place?

Well, CAD is about building models of real-world objects inside the computer. That is what CAD is. I believe that in the fullness of time, every object in the world, manufactured or not, will be modeled inside a computer.

That is a very, very big market. This is *everything.*

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making things that used to be analog digital, right? In some finite number of generations we won't have to suffer through this [photo shoot] because there will be digital cameras that are good enough to do that. Sound went digital in the 1980s; it was one of the huge consumer electronics successes. Musical instruments went digital, with MIDI. I think we see on the horizon that television is going digital, with whatever technology they adopt for HDTV.

And every time you go digital, whatever the original motivation may be, you end up with a tremendous number of ancillary benefits. The fact that the data are in a form that one can process them fundamentally changes things.

What CAD is about is that artifacts are going digital. In Arthur C. Clarke's book *Profiles of the Future*, in, I think, 1963, he had this timetable of the future for the next seventy-five years. One of the things he talked about was encoding of artifacts. In other words, storing artifacts in digital form, and potentially replicatable form.

That's what CAD is about. Today we're in very, very narrow areas of the whole field of being able to design and manufacture anything using your computer.

It all happened before. We had a word processing business before we had personal word processing, and it was in a very vertical market. All the analysts analyzed all the pie charts of market sector, and they missed the fact that there was a market for about another half billion word processors that weren't in the word processing market.

That's what's beginning to happen with CAD. We've seen it over the last ten years, but we haven't really seen anything like the takeoff yet. If you have lots of money and are very patient, you can get a stereo lithography system, set it up on your desk, build a 3-D model of something, push a button, and after an embarrassingly long time, get a piece of plastic that is a 3-D, faithful-within-the-resolution-constraints-of-this-device model. That's desktop manufacturing, and again, that's worse than the Altair level right now in terms of cost and time and plastic that you use and so forth.

But I expect in the ultimate destiny of this that there's going to be an appliance that sits on your desktop that can make anything. I don't expect that to happen within the lifetime of AutoCAD Release 13 or 14. But that's where it's all going.

This week we're shipping HyperChem, which lets you design objects at the molecular level. The technology is going to go on scaling down until we have the same level of fine-grained control over the structure of matter that biology has been using for the last billion years or so. And at that point, we're going to be able to make *anything* from a digital model.

That's going to change the world, beyond comprehension, I think.

And central to all of that happening is computer-aided design. You can't do anything without building a model of it. If you're building a workbench, even if you're doing it in your head, you have a model of it in your head. Something tells you how long to saw off the plank, something tells you how many supports you need. You have a model of it.

Doing models in a computer is going to make the whole process much simpler, eventually. When we figure out how to communicate these things, when we have the right user interface technology, when we have enough compute power to throw at these problems.

As the microcomputer has evolved, we've been picking off the easy things. Word processing, the personal database, the spreadsheet. I think the thing that kind of holds what Autodesk does together is we're doing stuff that's going to use up all those compute cycles over the next twenty or thirty years.

If you go on drawing that line on semi-log paper, and you assume that in 1998 you have the power of a Cray 2 on your desk—what are you going to use it for? You're going to use it to do things that are fundamentally different from what you use your Macintosh for, and are the kind of things that very, very few people are doing with Cray 2s right now.

That's what we try to identify—bet on the technology going on, start to build these ambitious things that can take advantage of the computing power as it arrives. That's what we've done constantly in CAD. I think we see it in desktop video. We certainly see it in molecular modeling. Xanadu's great today, but it's about a hundred times too slow. Well, time will solve that.

Those are the kinds of technologies, to me, that are a lot more interesting than going out and competing for market share points in the spreadsheet market or the word processing market or the database market.

These are things that don't exist at all today. It's hard to keep focused sometimes, as the years pass, on getting these things finished, and to keep the belief that it's going to happen.

But we have an existence proof. AutoCAD was not viable at the time we started working on it. There simply wasn't enough compute power around to do the job. The graphics were laughable. Time solved that. And if time hadn't solved that, we wouldn't be around.

As a strategy it can't fail. The strategy can only fail if you don't believe in it or you don't execute it properly. Do we really think that this evolution of technology is going to stop in the next two or three years? That suddenly machines aren't going to get any faster or have more memory? Even just the linear progression of the stuff we've got is going to carry us into the 21st century.

To me, plotting the strategy for a software company isn't very difficult. Particularly once you have a success like AutoCAD, because you have an installed base that is beating you over the head—"We want this, we want that, we want this other thing. We want you to do this. We also want this." So you don't have to do an enormous amount of market research when you've got six hundred thousand people out there asking you for things that you don't have. It's basically a question of deciding what to do first.

When you have the financial strength that we have, if it costs you a quarter million dollars to do a product, and one in a hundred succeeds the way AutoCAD has succeeded, we can do a hundred failures for each success. The ratio of what it costs you to build and launch a product, even today, to what you make when you hit, is the thing that makes this business totally unique.

This isn't like the chip business. It isn't like the steel business. It isn't like the auto business. It's like the movie business. You make lots and lots of movies in the hope that, if it's a great year, you'll have one blockbuster, and if it's an unbelievable year you'll have two blockbusters. But you probably made eighteen movies that year. And you may go two or three years making eighteen, none of which is a blockbuster—they may be profitable.

I think that's the kind of business we have here. It's a business that evolves rapidly, where preferences are difficult to predict, and yet failing to innovate is not the way you make a blockbuster. Making the nine hundredth Western doesn't give you the kind of success that making *Star Wars* did.

That's what I always look for. I think that every company that tries that—unless something exogenous happens to blow them up or they lose their vision—they all seem to succeed.

(The interview continues next month.)

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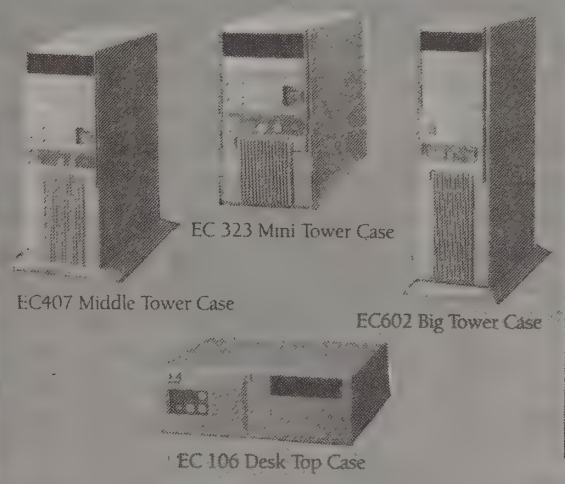

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PowerBook Repair

Tales Of The Bleeding Edge

BY MARY EISENHART

Date: Thu, 27 Feb 92 21:44:03 GMT -0700
To: MicroTimes <microx@well.sf.ca.us>
From: John Perry Barlow <barlow@eff.org>

Oh, one other thing. I have a terrible crisis on my hands which you might be able to assist with.

My PowerBook has burned to the ground!

I'm planning on being on the road for the next month most of the time, and never in one place for more than five days. Upon coming back from Japan, I am coming briefly through Wyoming and then leaving for Spain, France, and Germany. Then I'm going to be all over the East Coast, all the while trying to finish the lyrics book.

So I am desperate beyond description.

What I would like to do is figure out some way to pull an exchange between my machine (which is still under warranty, of course) and a working one when I pass through San Francisco on my way from Tokyo to Kansas City on Tuesday. Don't tell me anything about my Official Apple Dealer. You and I both know how far that will get me. Besides, I bought this through a developer's agreement, so my Apple Dealer is Apple.

Could you or Michael research this and tell me what my options are?

Dear readers, we sincerely hope this never happens to you. We hope the Sad Mac never shows his face on your PowerBook's screen. We hope nothing ever goes wrong with your PowerBook.

The point of the following saga, however, is that if something *does* go wrong, you've got resources.

THE ORTHODOX PATH

Upon receiving this transpacific distress call, my first move was to head over to The WELL's Macintosh conference, which is to the digital world approximately what BMUG is to the analog. I'd been singing the praises of the 170 there for months, and as more people went out and bought the machines the PowerBook topic developed into an essential information resource.

There, I explained the situation and called for help. One user reported that his PowerBook had also died. That a call to a mysterious toll-free hotline had brought an Airborne truck to his door. That Airborne had whisked the deceased PB away, to return it two days later in perfect working order. Free of charge.

Yeah, sure, I thought. Over the years Apple has distinguished itself for many excellent qualities, but remarkable support and efficient repair service have not been among them. The one-year warranty, as longtime Mac users will recall, is a recent innovation, and calling Cupertino with problems simply invoked the call-your-dealer mantra. Which, as Barlow crankily pointed out, would not serve in this situation.

Nonetheless, armed with the PB's serial number, I called the hotline (1-800-767-2775, 6 am–5 pm Pacific time, Monday through Friday)—the number of which is actually included with the PowerBook's documentation if I'd bothered to read it. I was not too optimistic, especially since the only working plan was to Airborne the machine from San Francisco to Apple and back to Wyoming. I expected major bureaucratic hassles at the very least.

I didn't get them. The initial recorded message pointed callers to the numbers they should press for Software Problems, Hardware Problems, etc. I soon reached a support person by the name of Reed. I gave him the serial number. He punched it in. "The machine belongs to John Barlow," he said a few seconds later.

More or less stunned by this efficiency, I explained the whole sorry mess. Reed was unfazed. It was duly arranged that we'd drop the PowerBook off at the Airborne office in San Francisco and that it would be returned to Barlow in Wyoming. The turnaround time was running around four days, Reed said.

And indeed, when Tuesday rolled around, there was a shipping box waiting for the PowerBook at the Airborne office. With properly done paperwork indicating that the machine was going to the repair facility in Texas,

Most of us are pretty fond of our desktop Macs anyway, but PowerBook dependency is far more formidable—the relationship is somewhere between right arm and family pet.

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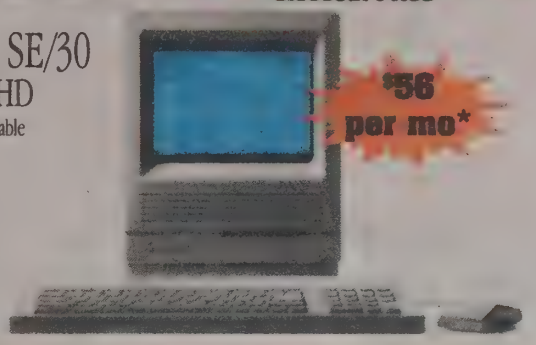

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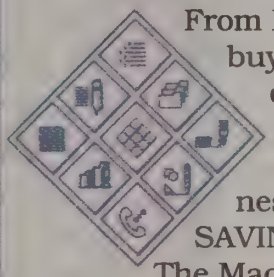

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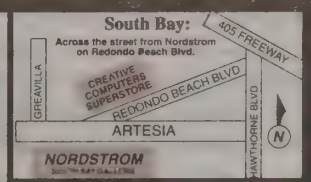

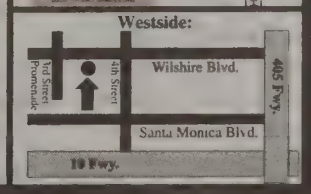

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and then back to Wyoming.

MEANWHILE...

Barlow, however, has never been known for his adherence to the orthodox path. Furthermore, for all the heroic efforts of the hotline team, it was risky to assume that the 170 would be restored to health and Wyoming before Barlow was off to Barcelona and points north.

Besides, exhibiting a syndrome familiar to PowerBook owners, Barlow found the prospect of doing without one in the interim unbearable. Even if it weren't for the fact that his PowerPort faxmodem was still in the 170, and a whole lot of necessary files were on its hard drive.

But even on the other side of the Pacific, Barlow's social engineering skills were in top form. Which explains why, at 6:30 in the morning at SFO, on the day Barlow was passing through, a mutual pal from Regis McKenna handed me a large black bag containing some unsuspecting young Apple marketroid's PowerBook 100, floppy drive, and assorted accoutrements. "I'm *sure* John will take good care of it," she said hopefully. "Unfortunately," she added, "it doesn't have a modem. But I'm sure he can deal with that..."

A merciful curtain should probably be drawn over the jet-lagged and warranty-voiding events of the next few hours. We will gloss over the ghastly spectacle of PowerBook innards on the kitchen table. We will mention in passing that should you decide to engage in such activities, it is most important to get TORX tools size 8 and 10 if you don't want to render the little screws unusable. We will give thanks to a benign universe for the fact that the only casualty of this scary do-it-yourself project was the port door of Barlow's 170, which, by general admission, was living on borrowed time anyhow. We will strongly suggest that kids not try this at home.

But we will also note that since the days when Steve Jobs was insisting that 128K was perfectly adequate, Mac hackers have been deviating from the orthodox and warranty-preserving path. (True, when the warranty on a Mac was 90 days, this was arguably less terrifying.) Following in this time-honored tradition are a handful of envelope-pushing PowerBook wizards, some of whom were conveniently located at MacAdam on Folsom Street in San Francisco, not far from the aforementioned kitchen table. And if you want to move files from a dead PowerBook's hard drive to a live PowerBook's hard drive, and you're only in town for a couple of hours, you'd do well to put your hardware in the hands of MacAdam's techs. And so we did. (In subsequent weeks MacAdam proved a life-saver on other people's PowerBook emergencies even more dire than this one, so we recommend these folks pretty enthusiastically.)

If you're in some town other than San Francisco, check with your local Mac user group. Mac user groups know where the local wizards are.

We left MacAdam with the modem and data of the 170 duly transferred to the 100. The 170 was consigned to Airborne. Barlow was consigned to Kansas City.

Seven days later, just in time to catch its owner heading for Spain, Barlow's 170 arrived safe and well on the doorstep. It subsequently had many adventures dealing with European telecomm protocols, a story which will be told in due course.

EPILOGUE

As we said, we hope your PowerBook serves you well and faithfully and you never have to deal with any of this. But if disaster strikes, you are far from stranded.

Apple is doing an exemplary job of supporting its PowerBook customers, and the hotline/Airborne approach is all most of us will ever need. Especially since voiding the warranty on an expensive piece of equipment is not something most of us want to do.

If you have extraordinary requirements, the Mac wizard community is rising to the challenge nicely.

PowerBooks have a way of creating a pretty visceral bond with their owners. Most of us are pretty fond of our desktop Macs anyway, but PowerBook dependency is far more formidable—the relationship is somewhere between right arm and family pet.

Lots of us have gotten to the point where installing cards and hard drives in a Mac II is no big deal. Even the Portable was pretty straightforward in this regard—you opened the case, plugged in the card, closed the case, and you were done. The PowerBook, on the other hand, is not for the inexpert or faint-hearted when it comes to this sort of thing. There are plenty of great third-party enhancements for the machines coming out, and any of them that go inside the machine (which is to say, practically all of them) require installation by an Apple-certified tech in order to preserve the PB's warranty.

Given that PBs become indispensable as fast as they do, Apple or one of its duly blessed licensees would be performing a real public service by offering classes in basic do-it-yourself PowerBook diagnostics and repair. Having watched a few at this point, I could probably do a modem installation if I had to, but I'd rather know what I was doing.

In a classic instance of turnpike effect, the PowerBooks are not just satisfying the pent-up demand for a go-everywhere Mac, they're spawning a whole new category of products and services for people who can't live without those go-everywhere Macs. There are some intriguing opportunities here, and it will be interesting to see what springs up in response. ■

One user reported that his PowerBook had also died. That a call to a mysterious toll-free hotline had brought an Airborne truck to his door. That Airborne had whisked the deceased PB away, to return it two days later in perfect working order. Free of charge.

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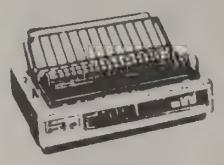

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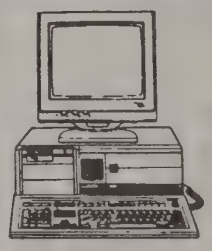

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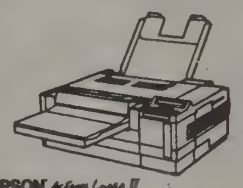

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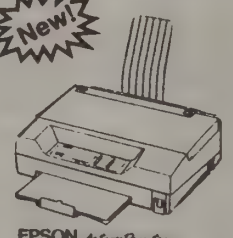

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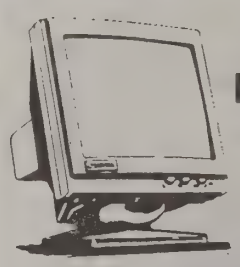

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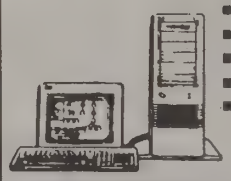

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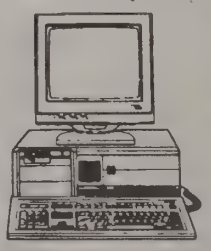

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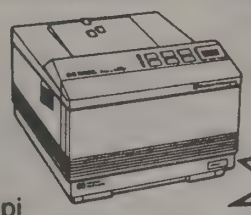

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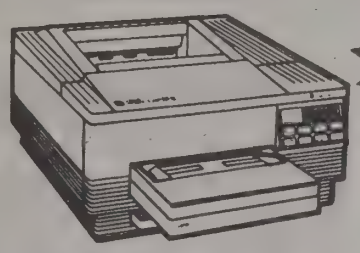

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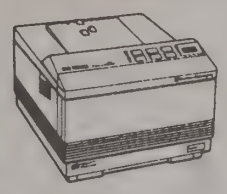

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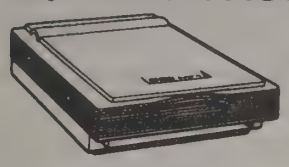

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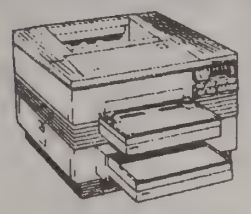

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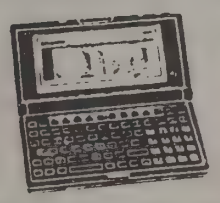

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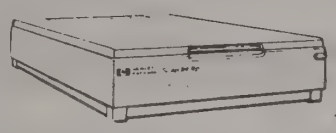

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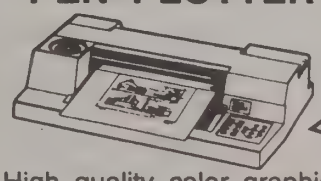

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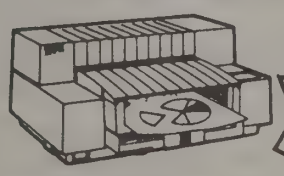

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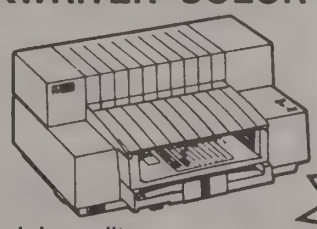

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Your First Computer

About Networks

BY MIKE MARKOWITZ

Local area networks, or LANs, represent one of the most intimidating topics in all of personal computing. But I cannot put off writing this column forever, and I've been meeting more and more users who have cobbled together their own home systems linking two or three computers—maybe we should call them DANs (domestic area networks).

Computer networking is not only an esoteric subject, with its own dense jargon, it is also an emotional issue, tapping into bubbling cauldrons of fear and loathing. Personal computing began with people who desperately wanted their very own computers because they were sick of begging some dorky System Administrator for a few more processor cycles or kilobytes of storage. Talk to a rugged individualist of personal computing about how neat local area networks can be, and he hears, looming in the background, the voice of the System Administrator saying, "No, you can't do that."

Why do people create personal computer networks? Usually to share scarce resources. Sometimes to share information or services. Network resources can be things like high-quality printers or high-speed modems. Information might be intra-office electronic mail, or a customer database that several workers need to access at the same time.

Like most computer topics, networking has a hardware part and a software part.

Like most computer topics, it also can be considered from a Macintosh perspective or an MS-DOS perspective. In the real world it often has to be considered from a mixed Mac/MS-DOS perspective, perhaps with UNIX, or some DEC or IBM mainframe thrown into the pot.

THE SEVEN-LAYER MODEL

To reduce networking to "a hardware part" and "a software part" is such a gross oversimplification that every engineer, consultant, and programmer who read the previous paragraph probably stopped reading in disgust.

The official way of dividing up the subject is called the OSI (Open Systems Interconnection) model. This is a mandatory viewgraph in every presentation about networks, and you can't get out of this column until you've seen it:

- **Physical Link**—the actual wires
- **Data Link**—what regulates data moving through the wires
- **Network**—what handles the routing or "addressing" of data packets
- **Transport**—what makes sure the data arrives intact—without errors
- **Session**—what manages communication
- **Presentation**—what translates data so that a program can display, store, or use it
- **Application**—what the user sees, points a mouse at, or types into.

A local area network consists of at least two computers with something to connect them. The connection is usually a physical cable, but wireless networks, based on infrared or radio signals, are also possible.

THE HARDWARE PART

A local area network consists of at least two computers with something to connect them. The connection is usually a physical cable, but wireless networks, based on infrared or radio signals, are also possible.

A network usually includes other devices besides computers, such as printers. Every device on a network is called a node.

In the MS-DOS world (IBM PCs and compatibles) there are two major network hardware standards: Ethernet and Token Ring.

Ethernet is a relatively old standard, developed more than twenty years ago as a way for remote terminals to communicate with mainframe computers at very high speed (up to 10Mbits per second, theoretically) over relatively long cable runs. There are different kinds of Ethernet cable—thick, thin, and "twisted pair" (the cheapest).

Token Ring is a newer standard promoted by IBM. It generally costs more and has two versions that differ in maximum data rate—4 or 16Mbits per second. Those Who Know say it is also more reliable across several of those seven OSI layers, and has other esoteric technical advantages.

Each computer needs some kind of network adapter that the cable plugs into. A network adapter can be a built-in feature of the computer, a circuit card that goes into a slot, or an external box that connects to the computer's serial (or parallel, or SCSI, or...) port.

The nature of the market is that network adapters get cheaper and more sophisticated every year, allowing more and more naive

Continued on page 77

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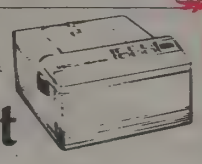

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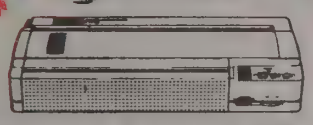

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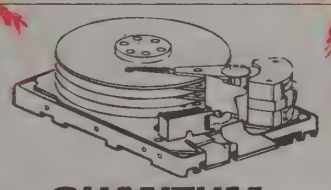

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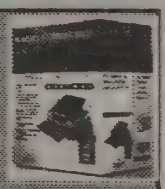

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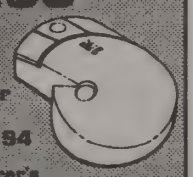

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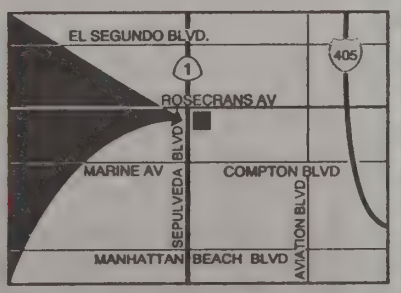

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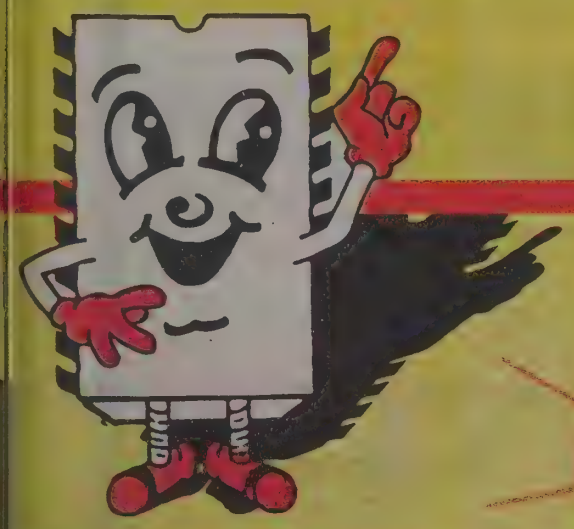

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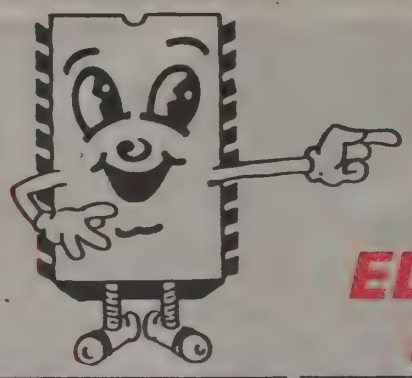

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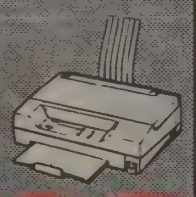
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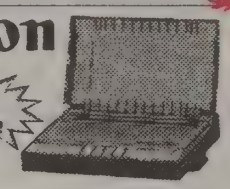
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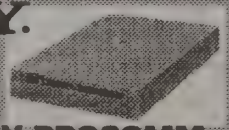
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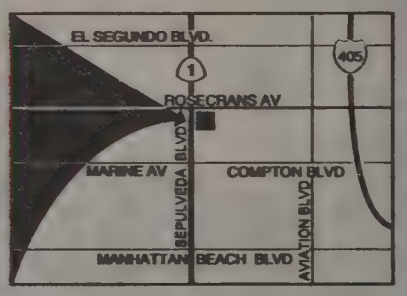

Continued from page 72

users to discover incompatible combinations. Farallon Computing, one of the leaders in Mac network hardware, recently released sixteen new Ethernet adapters for various Macintosh models, at prices ranging from $259 to $529.

MACINTOSH NETWORKS

In the Macintosh world, a basic network capability is built into every computer and many printers. The software part is called AppleTalk, while the hardware part, including various cabling options, is called LocalTalk—but Mac users often use these terms interchangeably.

On paper, LocalTalk is almost shockingly slow, with a maximum data rate of 230 kilobits per second. LocalTalk connectors plug into the serial printer port of a Mac, so throughput is limited to what an RS-232 serial port can support.

On the other hand, LocalTalk networks tend to be incredibly easy to install, operate, and manage (compared to their DOS rivals). The software part—AppleTalk—can operate very well over much faster networks; in fact, Apple has started building Ethernet capability into its latest models, such as the Macintosh Quadras and the newest laser printer.

THE SOFTWARE PART

There are many different ways in which a network can be organized. Engineers talk about different network "topologies," such as stars, rings, and branching trees. A LocalTalk network, for example, is a simple chain that cannot be joined in a ring—if you accidentally connect the first node to the last it gets confused and won't work.

Functionally, you can divide networks into two broad categories—peer-to-peer nets and server nets.

A peer-to-peer network is sometimes called a "distributed server" because network functions are shared by all the computers that are connected (and powered up). This is a relatively inexpensive way to share a printer and exchange files and messages within a small workgroup. The current Macintosh operating system (System 7.0 and higher) provides a simple, built-in peer-to-peer AppleTalk network.

With MS-DOS systems, you have to buy and install network software separately, since these functions are not built into the system software.

A server network uses one computer to host a central repository of programs, files, and network services. Ideally, a server should be a powerful, fast computer with lots of memory and hard disk storage. It is even possible for other computers on the network to be diskless workstations that rely on the server for almost everything.

Many commercial programs are available in "network-aware" versions that can be installed on the server and checked out by a remote user, rather like a library book. There are also "multiple-launch" network programs, that allow a certain number of copies to run simultaneously. Even more sophisticated are multiple-user programs—mostly databases—which use various file locking schemes to ensure that only one user at a time will be making changes to a particular data item.

A server can be a post office as well as a data library. "Mail server" software handles the time and date stamping, delivery, forwarding, enclosures, and other aspects of electronic mail. Most servers also provide printer spooling. If multiple users are all trying to print at the same time, the print spooler software stores them temporarily, manages an orderly print queue, and allows the users to get on with their work.

Automatic periodic backup is another important network service. Since users don't always take the time to make regular backups of critical files, it is reassuring to have a tape drive or removable cartridge device attached to the server, with software that routinely makes safe copies of all the files that have been changed since the last backup. There are even products that provide network virus checking and eradication.

The dominant vendor of MS-DOS network server software is Novell, Inc. Novell's family of products is called NetWare. NetWare has a reputation for being tricky to install and maintain; you can even take a training course to become a CNE ("Certified NetWare Engineer"). Developed originally for heavy-duty corporate applications, NetWare can be sized for small businesses—as few as five users for about $1100.

Other important players in the network software market include Banyan (whose product family is called VINES) and Artisoft, with a popular peer-to-peer product called LANtastic. There are many, many others.

People are eager to sell you total network "solutions." They are a high-profit item. If you are thinking about a network, here are some questions you should ask the next vendor, consultant, or customer engineer...

•How many installations of this system are in use?

•How do I actually add or remove nodes? How long does it take?

•How do I get updates or upgrades of the software? When is the next one?

•What do I do for after-sale service and support?

•Show me a list of compatible software applications.

•Tell me about known incompatibilities and bugs (marketing people don't like the word "bug"—they prefer to say "anomaly" or "undocumented feature").

Nobody will actually have answers to all of these questions, but the way they respond will tell you a lot about the outfit you are dealing with. ■

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PIC HANDHELD HARD DRIVE

The PIC HandHeld hard drive offers an ideal solution for laptop computers and file transfer, as well as system support. It is compatible with any parallel port on a PC and runs on DOS 3.0 or higher. This unit, weighing only 1.5lbs., measures 1.5" x 5" x 5" and includes a power supply, disk controller, cables, and battery. Using the internal, rechargeable battery, the PIC HandHeld can run for up to 4.5 hours. To transfer multiple, large files, the PIC HandHeld is faster and easier than most commonly used file transfer utilities. In addition, using the PIC HandHeld can also save time and frustration when setting up or repairing a network or other high-end systems that require dozens of floppy disks. (20MB version, $299) Pars International Computer Corp., 22441 Foothill Blvd., Hayward, CA 94541. (510)733-0103.

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PRODUCT UPDATES

➤**Berkeley Systems** released **After Dark 2.0 for Windows** with over forty screen-saving displays. For customers who purchased After Dark before December 1, 1991, the upgrade price is $14.95, including shipping and handling. Berkeley Systems, Inc., 2095 Rose St., Berkeley, CA 94709. (510)540-5535.

➤**Claris** announced a promotional offer bundling **In Control**, an innovative to-do list manager from **Attain Corp.**, with **MacProject II**. The bundle will be available through July 31, 1992. Claris Corp., 5201 Patrick Henry Dr., Box 58168, Santa Clara, CA 95052-8186. (408)987-7000.

➤**Claris** is shipping **Resolve 1.1**, an update to its Macintosh spreadsheet. Registered owners may update for $20. Claris continues to offer a trade-up price of $99 for owners of Excel, Lotus 1-2-3, Borland Full Impact, and Informix Wingz.

➤**Computer Associates** announced **CA-Cricket Graph v2.0 for the Macintosh**, a graphing package that allows business, scientific, and engineering users to analyze data and create high-quality charts. Computer Associates International, Inc., 711 Stewart Ave., Garden City, NY 11530-4787. 1-800-645-3003.

➤**Gupta Technologies** announced upgrades to its entire **SQLNetwork family of connectivity software**. The primary announcement is for **Version 3.0 of SQLNetwork for DB2**, a significantly enhanced version that enables LAN-based client PCs to access data on IBM mainframes. Gupta Technologies, Inc., 1060 Marsh Rd., Menlo Park, CA 94025. (415)321-9500.

➤**Quadtel's QMAPS v2.1** memory management upgrade now provides PC users with a minimum of 32K of additional upper memory, and as much as 64K when a Quadtel BIOS is installed. Quadtel System Software Corp., 3190-J Airport Loop, Costa Mesa, CA 92626. (714)754-4422.

➤**Sybase Open Server Release 2.0** enhances and simplifies Sybase's data integration capabilities, enabling a new class of applications that can combine diverse data resources. Sybase, Inc., 6475 Christie Ave., Emeryville, CA 94608. (510)596-3500.

➤**System Plus** introduced **The Medical Manager v7.10** for UNIX and XENIX. Versions running under DOS, Concurrent DOS, and most networks will be available within the next few months. System Plus, Inc., 500 Clyde Ave., Mountain View, CA 94043. (415)969-7047.

➤**WordStar** introduced **WordStar for DOS v7.0**. Registered users of previous versions can upgrade for $89. WordStar is also offering the upgrade to users of either Microsoft Word or WordPerfect until June 30, 1992. WordStar International, Inc., 201 Alameda Del Prado, Novato, CA 94949. (415)382-8000.

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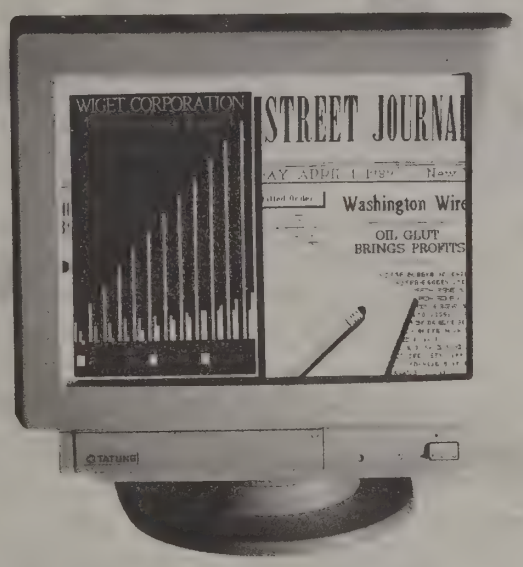

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CM-14SAS	14" 0.28mm SVGA	31.5KHz/35K-38KHz	1024x768 (I.)
CM-14SAE	14" 0.28mm SVGA	31.5KHz/35K-38KHz	1024x768 (I.) VLMF+
CM-1400	14" 0.25mm SVGA	31.5KHz/35K-38KHz	1024x768 (I.) *
CM-14UAS	14" 0.28mm UVGA	31.5/35.5/37.5/48 KHz	1024x768 (N.I.)
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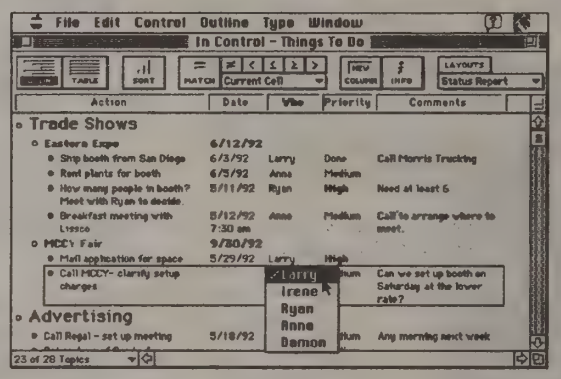
In Control is a to-do list manager that helps businesspeople organize projects and things-to-do, and then reorganize, categorize, and prioritize them. Authors Dan Chadwick and Alan Albert, creators of FileMaker, designed In Control to give managers the tools they need to more easily juggle priorities and accomplish more. Based on the familiar outline format, users can collapse and expand their hierarchy of to-do's to show the level of detail they need. In Control goes far beyond traditional outlining software by providing users with the power to create an unlimited number of columns to track due dates, resources, priorities, or anything else. ($129.95) Attain Corp., 48 Grove St., Somerville, MA 02144-2500. (617)776-1110.



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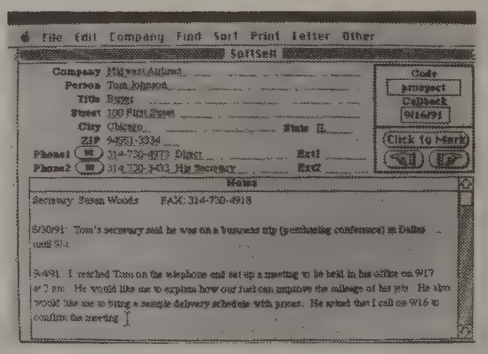

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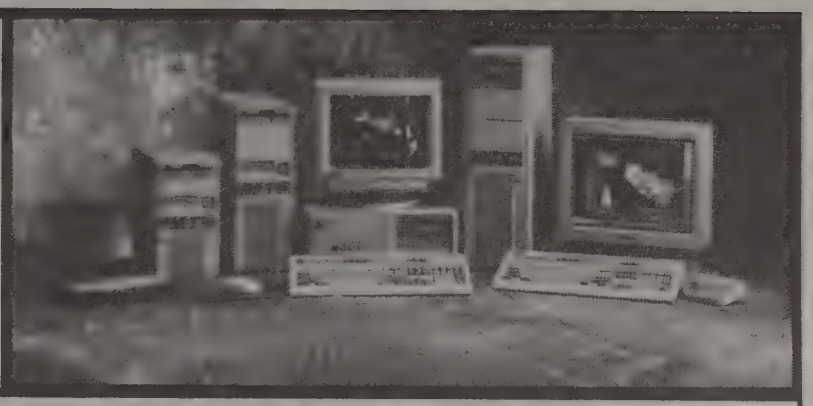

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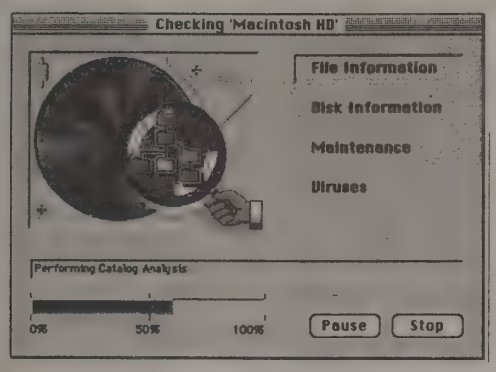

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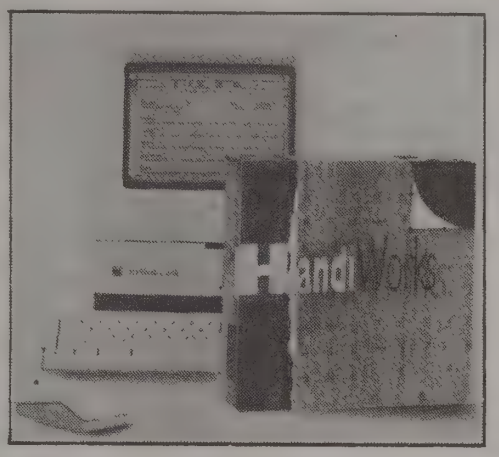

REVIEWS

GAME REVIEWS

By Mike Markowitz

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Published By: Titus Software
For: MS-DOS (512K, EGA/VGA/Tandy 16-color graphics, Adlib or MT-32 audio card), Amiga and Atari ST versions also available
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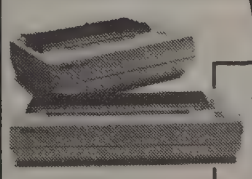

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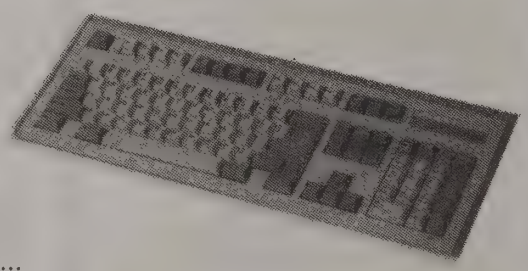

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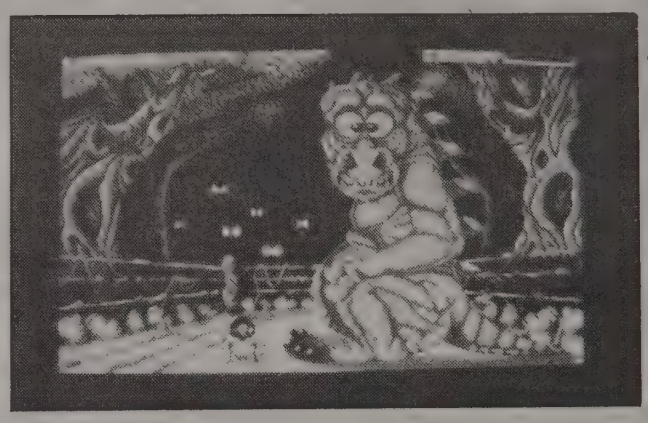


lithic landscape, hunting for food and collecting bonus items. You climb up ladders and descend into caves. You hit things with your club, including the Turtosaurus and the deadly Pteriyaki. They hit back, until you run out of lives. The quality of the animation compares favorably with the best 16-bit Nintendo and Genesis stuff I've seen. The game has a cute sense of humor. It's silly. I liked it.

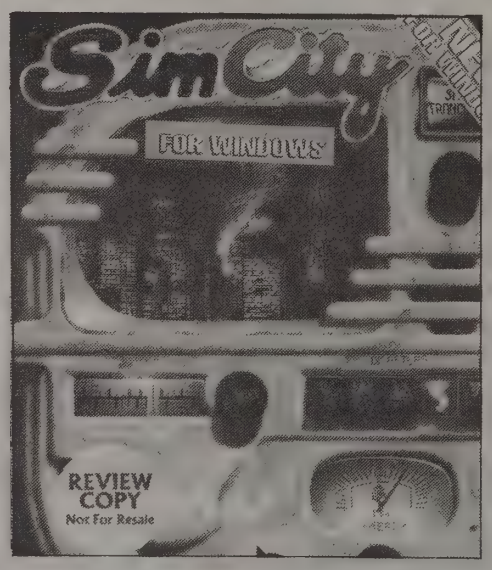
The 3.5" disk is copy-protected in a way that made it impossible to install on my hard drive. How quaint. Documentation consists of a colorful little 16-page booklet.

You really need a joystick to get the most out of this one, although keyboard control is, just barely, possible. (Titus Software, Inc., 20432 Corisco St., Chatsworth, CA 91311. 818/709-3692)

Graphics and Animation: 8
Sound: 7
User Interface: 6
Overall Play Value: 7

SIMCITY FOR WINDOWS

Published By: Maxis
For: Microsoft Windows 3.1 (requires at least 2MB of RAM, supports EGA and VGA)
List Price: $59.95



It is hard to see much advantage in porting the classic "software toy" SimCity ("over 250,000 sold") to the Windows environment, but it's inevitable—people want everything now in a Windows version, and the market responds to what people want. Maxis wisely decided to postpone the release of the new version until Windows 3.1 ships, to ensure compatibility and take advantage of improved performance and (let's hope) reliability.

As mayor of SimCity running under Windows, you will be able to jump in and out of other applications, if you think a spreadsheet or database will help you to fight crime, unemployment, and pollution. The simulation has a new Control Bar that lets you set bookmarks that zoom you to any area of city at the click of a mouse button. The tool boxes are now floating tool palettes that can be moved out of your way on the screen.

Continued on page 94

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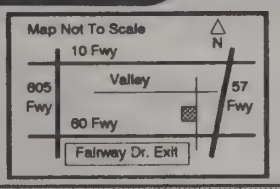

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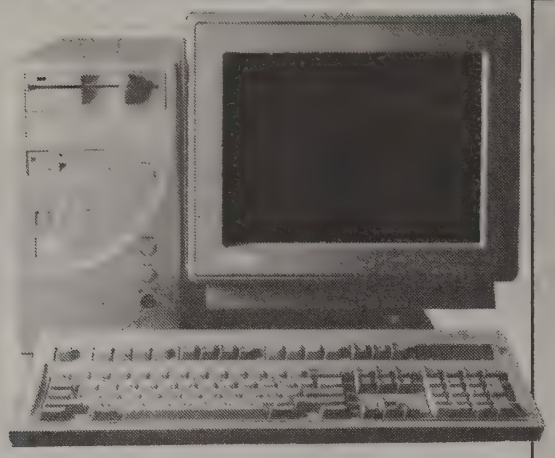

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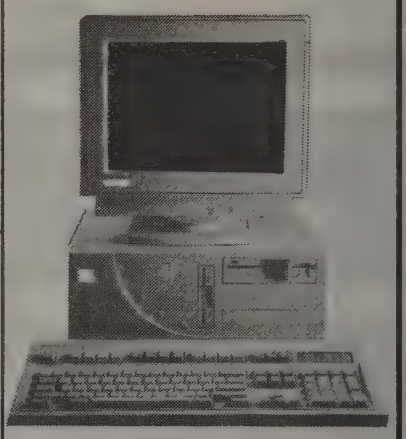

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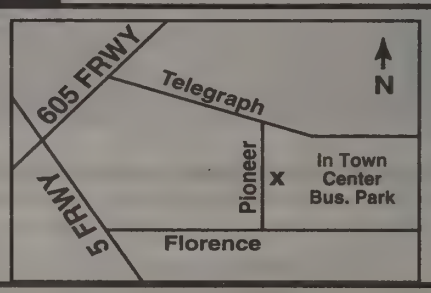

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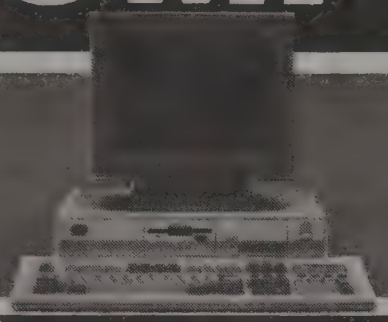

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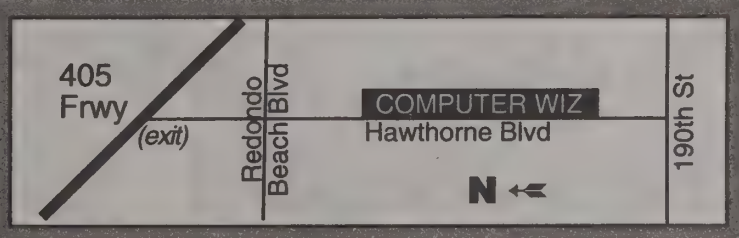

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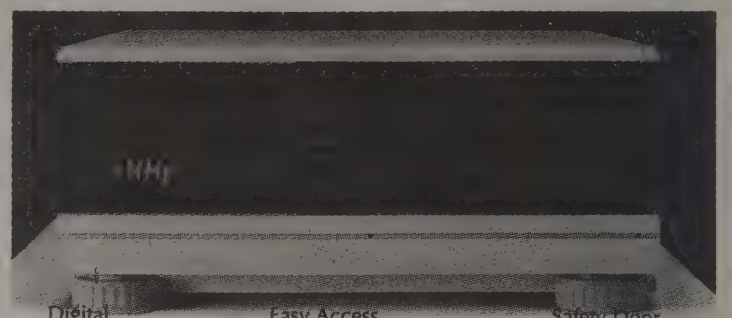

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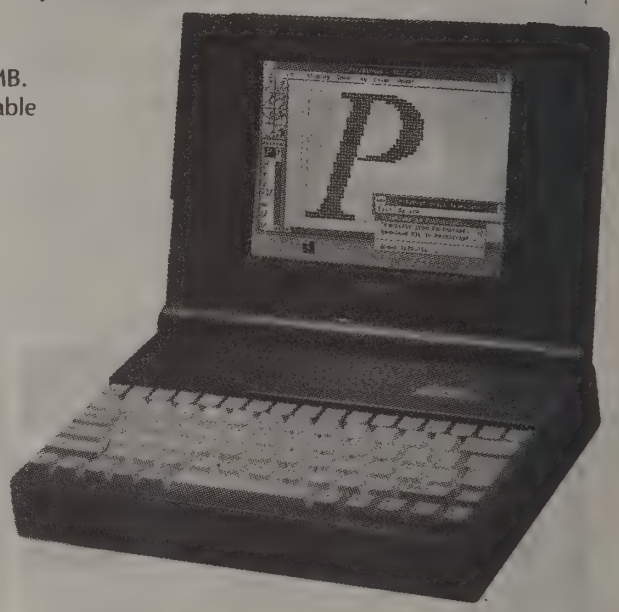

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- 32 Gray, super twist LCD screen
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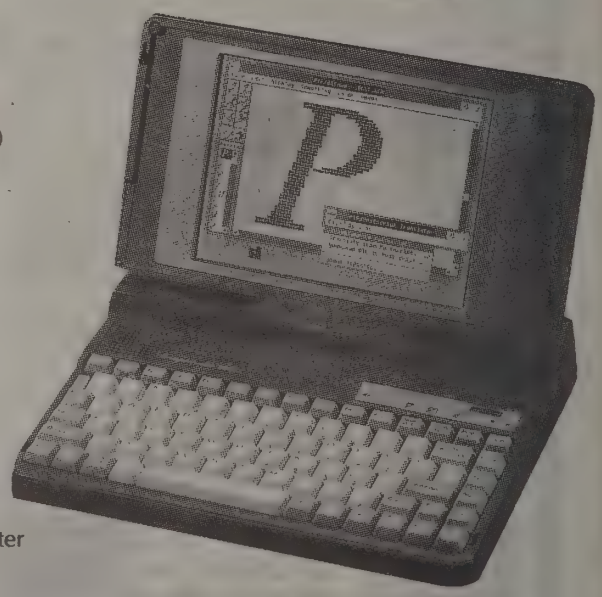

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- Full-Featured, mechanical 83-key keyboard
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- External keyboard and monitor ports
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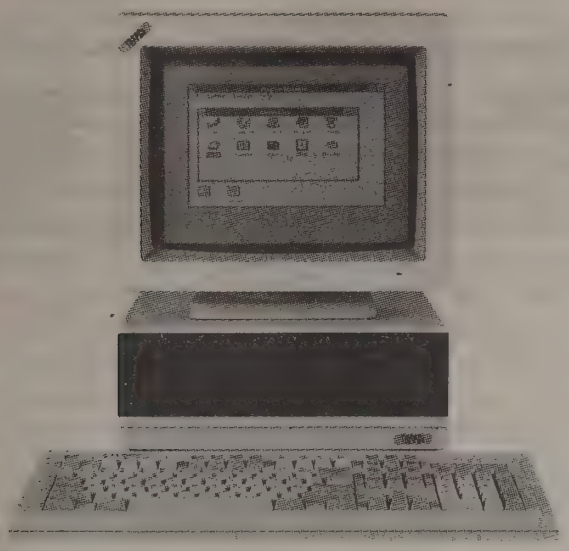

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- Intel386 DX-33/40MHz processor
- 4MB RAM, expandable to 32MB
- 64K cache, expandable to 256K
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- TEAC 1.44MB 3.5" floppy disk drive
- 1 parallel, 2 serial **& 1 game ports**
- Super VGA adapter w/1MB
- 14" 1024 x 768 color Super VGA monitor (.28mm)
- 101 key click keyboard
- MS DOS 4.01 or 5.0
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- Super VGA adapter w/1MB
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- 101 key click keyboard
- Compatible with DOS, OS/2 & UNIX
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- TEAC 1.44MB 3.5" floppy disk drive
- 1 parallel, 2 serial **& 1 game ports**
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- MS DOS 4.01 or 5.0
- MS Windows 3.0 & serial mouse
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- Mid tower case with power supply (220W LED)

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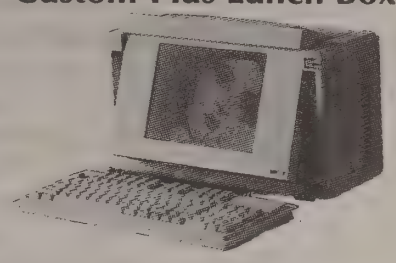

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- 102 key Enhanced keyboard
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Continued from page 88

Maxis has done a good job ensuring backward compatibility. The Windows version can use the add-on Graphics Sets designed for earlier versions, and it can read maps designed with the SimCity Terrain Editor. The package includes 3.5" and 5.25" disk formats, a quick reference card, and a 72-page manual with a very readable essay on the history of City Planning.

I highly recommend SimCity for computer-oriented high school or college teachers of urban studies, economics, politics, or social science. Only an interactive simulation like this can really communicate the way a complex system works—where your brilliant, simple solution to one problem may create new problems or make existing ones worse. (Maxis, Inc., 2 Theatre Sq., Orinda, CA 94563-3346. 510/254-9700)

Graphics and Animation: 8
Sound: NA
User Interface: 8
Overall Play Value: 7
Educational Value: 9

BLADE

Designed By: Mark Fortuna and Greg Onychuk
Published By: Leviathan
For: Macintosh (requires minimum 640 x 480 8-bit color monitor and 2MB free RAM, 12MB of hard disk space, System 7 friendly)
List Price: $99.95

"Here's a hint about playing the game. Practice, practice, practice. We did not design BLADE to be easy..."

This is an understatement. BLADE is, by far, the most difficult arcade-type game I have ever seen. Since the years have not been kind to my hand-eye coordination, I asked some very young, very Macintosh-savvy gamers to have a try. None of them could get off the first screen.

"Creatures...Defeat or avoid them, but remember, some carry keys. Note: There are some creatures that cannot be destroyed."

BLADE is a visually and sonically stunning game that sets a new size record for Macintosh entertainment software. The compressed program files are installed (by a standard StuffIt installer) from six high-density disks. The complete package takes up 12MB of hard disk space; but you can leave out the sound files if your free space is limited. Documentation consists of a slim booklet.

BLADE is a classic arcade action game. You use simple keyboard controls to move an animated figure through a multilevel psychedelic landscape, slashing away at creatures of all kinds. Although a mouse is a very poor substitute for a joystick, keyboard controls somehow seem completely wrong for a Macintosh game.

The screens are richly detailed and lovingly drawn, but the animated figures (on the 13" Apple monitor) seem rather small.

Leviathan's next game, tentatively called Dragon Boy, is scheduled for summer release. I hope the very talented design team rethinks their idea of an appropriate level of difficulty for Macintosh entertainment software. (Leviathan, Inc., 31201 Chicago Rd. S., Warren, MI 48093-5527. 313/826-3560)

Graphics and Animation: 9
Sound: 9
User Interface: 3
Overall Play Value: 2

MACINTOSH SOFTWARE REVIEW

POWER WINDOWS

Published By: Kiwi Software
List Price: $79.95

TILES

Published By: CE Software
List Price: $99.95
Reviewed By: Paul Hoffman

In the past few years, few really new software products have appeared. All the spreadsheets, databases, and word processors that will exist already do now, although some companies may copy the features from a current program

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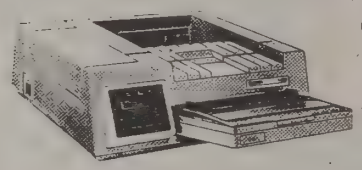

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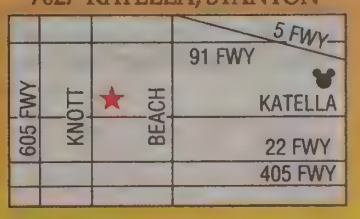

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UMC Baby 386-40MHz M/B w/64K Cache	$270.00(260.00)
C & T Baby 386-40MHz M/B w/64K Cache	$285.00(275.00)
OPTI Baby 386-33MHz M/B w/64K Cache (Write-back cache)	$270.00(260.00)
OPTI Baby 386-33MHz M/B w/64K (AMD PQFP CPU)	$260.00(250.00)
C & T Baby 386-33MHz M/B w/64K Cache	$280.00(270.00)
****256K Cache Upgrade for all 486 and 386 M/B*	*+$60.00(55.00)*
OPTI Baby 386-25MHz M/B	$235.00(205.00)
OPTI Baby 386-25MHz M/B (AMD PQFP CPU)	$205.00(197.00)
Symphony Mini 386-25MHz M/B (max 32MB on board)	$215.00(208.00)
C & T Mini 386SX-25MHz M/B	$163.00(157.00)
Headland Mini 386SX-25MHz M/B	$158.00(152.00)
Headland Mini 386SX-16MHz M/B	$138.00(133.00)

KEYBOARDS

Focus 2001 101 Keys Keyboard w/Hard Dustcover (Click)	$44.00(42.00)
Focus 5001 130 Keys Keyboard (Dble function keys, Calculator, etc)	$60.00(58.00)
Focus 6000 101 Keys Keyboard (Soft Click)	$42.00(40.00)
Focus 7000 108 Keys Keyboad (Diagonal arrows, Soft Click)	$45.00(43.00)
Focus 8000 111 Keys Keyboard (With Calculator, Soft Click)	$49.00(47.00)
Focus 9000 128 Keys Programmable Keyboard	$72.00(70.00)
Fujitsu 4700 101 Keys Keyboard	$47.00(45.00)
Fujitsu 4850 101 Keys Keyboard	$40.00(38.00)
Honeywell 101WN 101 Keys Keyboard (3yr. earranty, Non-Click)	$40.00(38.00)
KT-2000 101 Keys Keyboard (Keytronic Made)	$47.00(45.00)

FLOPPY & HARD DISK DRIVES

TEAC 1.2MB FDD (5.25")	$62.00(59.00)
TEAC 1.44MB FDD (3.5") w/Mounting Kit	$58.00(55.00)
TEAC 2.88MB FDD (3.5") w/Mounting Kit & Controller	$168.00 (162.00)
Panasonic 1.2MB FDD (5.25")	$59.00(56.00)
Panasonic 1.44MB FDD (3.5") w/Mounting Kit	$55.00(52.00)
Conner CP-3000 40MB IDE HDD (29ms)	$220.00(212.00)
Conner CP-30064 60MB IDE HDD (19ms)	$260.00(250.00)
Conner CP-30084 80MB IDE HDD (19ms)	$290.00(278.00)
Conner CP-30104 120MB IDE HDD (19ms)	$365.00(350.00)
Conner CP-3204F 210MB IDE HDD (16ms)	$590.00(568.00)
Maxtor MX-7080A 80MB SCSI HDD (17ms)	$293.00(282.00)
Maxtor MX-7080S 80MB SCSI HDD (17ms)	$293.00(282.00)
Maxtor MX-7120A 130MB IDE HDD (17ms)	$365.00(350.00)
Maxtor MX-7120S 130MB SCSI HDD (15ms)	$365.00(350.00)
Maxtor LXT-213A 213MB IDE HDD (15ms)	$590.00(568.00)
Maxtor LXT-213S 213MB SCSI HDD (15ms)	$590.00(568.00)
Maxtor LXT-340A 340MB IDE HDD (15ms)	$970.00(933.00)
Maxtor LXT-340S 340MB SCSI HDD (15ms)	$970.00(933.00)
Maxtor XT-4380E 338MB ESDI HDD (16ms)	$1025.00(986.00)
Maxtor XT-4380S 337MB SCSI HDD (16ms)	$1025.00(986.00)
Maxtor XT-8760E 676MB ESDI HDD (16.5ms)	$1405.00(1350.00)
Maxtor XT-8760S 675MB SCSI HDD (16.5ms)	$1405.00(1350.00)
Maxtor PO-12S 1.2GB SCSI HDD (15ms)	$1850.00(1780.00)
Quantum LPS52AT 52MB IDE HDD (17ms,64K Cache)	$255.00(245.00)
Quantum LPS84AT 84MB IDE HDD (17ms,64K Cache)	$310.00(298.00)
Quantum LPS105AT 105MB IDE HDD (17ms,64K Cache)	$335.00(322.00)
Quantum LPS12A012 120MB IDE HDD (17ms,256K Cache)	$370.00(256.00)
Quantum LPS24A012 249MB IDE HDD (16ms,256K Cache)	$625.00(600.00)
Seagate ST-351AX 42MB IDE HDD (28ms)	$206.00(196.00)
WD AC280 80MB IDE HDD (19ms)	$290.00(278.00)
WD AC2120 125MB IDE HDD (16ms)	$365.00(350.00)
WD AC2200 209MB IDE HDD (12ms, 1" thick)	$590.00(568.00)
SyQuest SQ555 44MB SCSI Removable Disk Drive	$305.00(294.00)
SyQuest SQ5110 88MB SCSI Removable Disk Drive	$445.00(428.00)
SyQuest SQ400 44MB Cartridge	$75.00(72.00)
SyQuest SQ800 88MB Cartridge	$108.00(104.00)
SyQuest SQ01 SCSI Adapter w/Software (Internal Only)	$45.00(43.00)

POWER SUPPLIES

XT-150W Power Supply	$34.00(32.00)
Mini-AT 200W Power Supply (XT size)	$40.00(38.00)
AT-200W Power Supply (Full size)	$45.00(43.00)
PS-2 200W UL Power Supply (For Mini-Vertical or Baby-AT Case)	$46.00(44.00)
PS-2 230W UL Power Supply (For Mini-Vertical or Baby-AT Case)	$49.00(47.00)

CHASSIS

	LOW PRICE
CS-20 Baby AT Case w/200W UL P.S. (3x5.25",2x3.5" Base)	$85.00(82.00)
CS-22 Slime Line Case w/200W UL P.S. (2x5.25",2x3.5" Base)	$88.00(85.00)
CS-35 Mid Vertical Case w/230W UL P.S. (3x5.25",3x3.5" Base ,Dig)	$110.00(110.00)
CS-36 Full Vertical Case w/230W UL P.S. (6FDD/2HDD Base ,Dig)	$137.00(132.00)
CS-D2 Baby AT Case w/200W P.S. (3x5.25",1x3.5" Base)	$70.00(67.00)
CS-M1 Mini Vertical Case w/200W P.S. (2x5.25",3x3.5" Base, Dig)	$70.00(67.00)
CS-M2 Mini Vertical Case w/200W P.S. (2x5.25",3x3.5" Base)	$68.00(65.00)
CS-931 Mini Vertical Case w/200W P.S. (2x5.25",3x3.5" Base ,Dig)	$73.00(70.00)
CS-923 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5" Base, Dig)	$95.00(92.00)
CS-912 Full Vertical Case w/230W P.S. (4FDD/2HDD Base,Dig.)	$125.00(120.00)
Diamond Series (Black Color Cases)	*+$5.00*
CS-130 Full Vertical Case w/250W UL P.S. (4FDD/2HDD Base, Dig)	$159.00(153.00)
CS-230 Mid Vertical Case w/250W UL P.S. (4FDD/2HDD Base, Dig)	$149.00(143.00)
CS-330 Mini Vertical Case w/220W P.S. (2x5.25",3x3.5" Base,Dig.)	$96.00(92.00)
CS-530 Desktop AT Case w/250W UL P.S. (4x5.25",2x3.5" Base, Dig)	$109.00(105.00)
CS-730 Baby AT Case w/250W UL P.S. (3x5.25",1x3.5" Base, Dig)	$99.00(95.00)
CS-830 Slim line Case w/220W P.S. (2x5.25",1x3.5" Base,Dig.)	$98.00(94.00)

PRINTERS

Citizen 200GX Printer (9pin/213cps/80col/Color option)	$168.00(162.00)
Citizen GSX-130 Printer (24pin/180cps/80col/Color option)	$241.00(232.00)
Citizen GSX-140+ Printer (24pin/220cps/80col/Color option)	$296.00(285.00)
****Color Kit for Citizen 200GX, GSX-130 & GSX-140+*	*+$45.00(43.00)*
Citizen GSX-145 Printer (24pin/192cps/132col/Color option)	$378.00(364.00)
Hewlett Packard DeskJet 500 Pritner	$425.00(409.00)
Hewlett Packard DeskJet 500C Color Jet Printer	$727.00(699.00)
Hewlett Packard LaserJet IIP+ w/Toner	$837.00(805.00)
Hewlett Packard LaserJet IIIP w/Toner	$1055.00(1015.00)
Hewlett Packard LaserJet III w/Toner	$1545.00(1485.00)
Panasonic KX-P1180 Printer (9pin/240cps/80col)	$161.00(155.00)
Panasonic KX-P1123 Printer (24pin/240cps/80col)	$206.00(198.00)
Panasonic KX-P1124i Printer (24pin/300cps/80col)	$291.00(280.00)
Panasonic KX-P1624 Printer (24pin/192cps/132col)	$354.00(340.00)
Panasonic KX-P2180 Quiet Printer (9pin/240cps/Color option)	$182.00(176.00)
Panasonic KX-P2123 Quiet Printer (24pin/240cps/Color option)	$256.00(246.00)
Panasonic KX-P2624 Quiet Printer (24pin/182cps/132col)	$398.00(383.00)
****Color Kit for Panasonic KX-P2180, 2123 & 2124*	*$45.00(43.00)*
Panasonic KX-P4410 Laser Printer (5ppm/512K/300dpi)	$658.00(635.00)
Panasonic KX-P4430 Laser Printer (5ppm/PCL5)	CALL
Star NX-1001 Multi-Font Printer (9pin/180cps/30col)	$142.00(137.00)
Star NX-1020R Color Pritner (9pin/180cps/80col)	$186.00(186.00)
Star NX-2420R Color Printer (24pin/250cps/80col)	$294.00(283.00)
Star NX-2420 Multi-Font Printer (24pin/250cps/80col)	$244.00(235.00)
Star SJ-48 Starjet InkJet Color Printer	$308.00(296.00)

MONITORS

CTX 5468 14" SuperVGA (Triscan) Color Monitor (1024x768,.28dp)	$292.00(280.00)
CTX 5468NI 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$330.00(318.00)
CTX 1760 17" Flat-Screen VGA Monitor (1280x1024,.28dp)	$1070.00(1030.00)
Suziba SD-212A 12" Amber Monchrome Monitor	$80.00(77.00)
Suziba SD-414AF 14" Amber Monochrome Monitor (Flat Screen)	$99.00(95.00)
Suziba SD-414VFM 14" Mono VGA Monitor	$118.00(113.00)
ViewSonic 1 14" VGA Monitor (640x480,.39dp)	$240.00(230.00)
ViewSonic 2 14" VGA Monitor (640x480,.28dp)	$295.00(284.00)
ViewSoinc 4E 14" SuperVGA Monitor (1024x768,.28dp)	$320.00(308.00)
ViewSoinc 5+ 14" Non-Interlaced Monitor (.25dp, 70Hz refresh rate @ 1024x768)	$525.00(509.00)
ViewSonic 5E 14" Non-Interlaced Monitor (.28dp, 72Hz refresh arate @ 1024x768)	$428.00(409.00)
ViewSonic 6 14" Non-Interlaced Color Monitor (1024x768.,28dp 72Hz refresh @ 800x600)	$360.00(346.00)
ViewSonic 6E 14" Non-Interlaced Monitor (.28dp, 72Hz refresh rate @ 800x600)	$350.00(337.00)
ViewSonic 7 17" FS Digital Auto-Tracking Multi-Frequency Monitor (.28dp, 1280x1024)	$1145.00(1095.00)
ViewSonic 8 20" Digital Auto-Tracking Multi-Frequency Monitor (.31dp, 1280x1024)	$1655.00(1595.00)
NEC MultiSync 3FGx 15" Monitor (1024x768,.28dp,Non-Interlaced)	$670.00(645.00)
NEC MulitSync 4FG 15" Monitor (1024x768,.28dp,Non-Interlaced Accu Color & Digital Controls)	$780.00(750.00)
NEC MulitSync 5FG 17" Monitor (1024x768,.28dp,Non-Interlaced Accu Color & Digital Controls)	$1488.00(1430.00)
NEC MultiSync 6FG 21" Monitor (1024x768,.28dp,Non-Interlaced Accu Color & Digital Contorls)	$2988.00(2875.00)
Sony CPD-1304 14" Multiscan Monitor (Non-Interlaced,.25dp)	$595.00(572.00)
Sony CPD-1604 17" Multiscan Monitor (Non-Interlaced,.25dp)	$1120.00(1075.00)

ADD-ON BOARDS

Mono/Graphics/Printer Card	$15.00(16.00)
TVGA-9000 VGA Card w/256K (Trident 8000 chipset, 1024x768)	$48.00(46.00)
TVGA-8900C 1MB VGA Card (Trident 8900C chipset, 1024x768)	$76.00(73.00)
PVGA-1C VGA Card w/256K (WD90C11 Paradise chipset)	$56.00(54.00)
PVAG-1D VGA Card w/1MB (WD90c30 Paradise chipset)	$89.00(93.00)
ET-4000 1MB VGA Card (Tseng Lab ET-4000 Chipset)	$103.00(99.00)
ET-4000HC 1MB VGA Card Tseng Lab ET-4000 Chipset, Sierra Hi-Color chip 32,768 colors)	$130.00(125.00)
ATI VGA Wonder XL VGA Card (OEM Version)	$169.00(163.00)
ATI VGA Wonder XL VGA Card w/Mouse (OEM Version)	$198.00(190.00)
ATI Graphics Vantage w/1MB & Mouse (11 times faster than SuperVGA Cards, OEM package)	$295.00(284.00)
ATI Graphics Ultra w/1MB & Mouse (24 times faster than SuperVGA Cards, OEM package)	$455.00(438.00)
Diamond SpeedStar 1MB VGA Card w/Hi-Color chip	$195.00(188.00)
Diamond Stealth 1MB Window Accelerator w/Hi-Color chip	$296.00(285.00)
Orchid Pro-Designer II 1MB VGA Card (1024x768 72Hz refresh rate @ 800x600)	$148.00(142.00)
Orchid Pro-Designer IIs 1MB VGA Card (w/Sierra RAMDAC 32,768 colors 70Hz refresh rate @ 1024x768)	$189.00(182.00)
Orchid Fahrenheit 1280 1MB VGA Card (12 times faster than Super VGA cards (w/Sierra RAMDAC, 32,768 colors, 70Hz refresh @1024x768)	$282.00(272.00)
AT I/O Card (2S, 1P, 1G)	$16.00(15.00)
Parallel (Printer) Card	$11.00(10.00)
Game Card (Dual Ports)	$12.00(11.00)
AT IDE Dual Floppy & Hard Disk Adapter w/Cable	$17.00(16.00)
AT IDE Dual Floppy & Hard Disk Adapter w/Cable & 2S/ 1P/ 1G	$26.00(25.00)
ULTRASTOR 12F 1:1 ESDI Floppy/Hard Disk Controller	$155.00(149.00)
ULTRASTOR 12C 1:1 Caching ESDI F/H Disk Controller w/1MB	$440.00(423.00)
ULTRASTOR 15C Caching IDE F/H Disk Controller w/1MB	$275.00(264.00)
Future Domain 850 (8 Bit) SCSI Hard Disk Controller	$66.00(64.00)
Future Domain 1670 (16 Bit) SCSI F/H Disk Adapter Kit	$164.00(158.00)
Always IN-2000 16-bit SCSI Host Adpater (Novell certified)	$196.00(189.00)
ADAPTEC AHA-1542B SCSI (Card only)	$239.00(230.00)
ADAPTEC AHA-1542BK SCSI (Bus Master Host Adatpe Kit)	$289.00(278.00)
****EISA Controllers for SCSI, ESDI, IDE*	*$CALL*

MISCELLANEOUS

Mitsumi Internal CD-ROM w/Controller & Software	$265.00(255.00)
Sony CDU 535 5.25" Internal CD-ROM Drive (Sony Bus)	$348.00(335.00)
Sony CDU7205 5.25" External CD-ROM Start-Up Kit w/6CDs	$568.00(545.00)
Logitech Serial MouseMan	$58.00(56.00)
Logitech Bus MouseMan	$70.00(68.00)
Logitech PS-2/Serial Combo MouseMan	$70.00(68.00)
Logitech Serial Trackman	$65.00(63.00)
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Logitech Scanman 32 (Hand-held Scanner)	$148.00(144.00)
Logitech Scanman 256 (Grey Scale Scanner)	$265.00(255.00)
Logitech ScanMan 256 w/Perceive Personal OCR Software	$310.00(298.00)
ArtyMouse AX300 Serial Mouse w/Mouse Pocket & Pad	$21.00(20.00)
TrueDox Trackball (Serial)	$35.00(34.00)
Z-Nix Super Mouse w/MicroSoft Windows	$66.00(64.00)
Smart-One Internal 2400 Baud Data Modem	$44.00(42.00)
Smart-One External 2400 Baud Modem	$67.00(65.00)
Smart-One Internal 9600/4800/2400 Baud Send/Receive Fax Modem	$80.00(78.00)
U.S. Robotics Sportster 2400PC Internal Modem	$138.00(134.00)
U.S. Robotics Sportster 2400 External Modem	$149.00(144.00)
U.S. Robotics Sportster 9600PC Internal Modem (V.32/V.42bis)	$418.00(402.00)
U.S. Robotics Sportster 9600 External Modem (throughput to 38,400bps)	$452.00(435.00)
U.S. Robotics Courier HST External Modem (V.42 & bis,38,400 bps)	$562.00(545.00)
U.S. Robotics Courier HST Dual STD External Modem (Asymmetric HST Mod,V.32bis)	$798.00(770.00)
Zoltrix 2400i Internal 2400 Baud Data Modem	$40.00(39.00)
Zoltrix Integra Internal 9600/4800/2400 Baud S/R Fax/Data Modem	$76.00(74.00)
Zoltrix Standard Internal 9600/2400 Baud Send/Receive Fax/Data Modem	$94.00(91.00)
Zoltrix Enhanced Internal 9600/2400 Baud S/R Fax Modem w/Hardware MNP5 & V.42 bis	$120.00(116.00)
Zoltrix Pocket 9600/2400 Send/Receive Fax/Data Modem	$160.00(154.00)
Zoltrix 9600i Internal 9600 Baud Data Modem w/MNP5 & V.42 bis	$278.00(268.00)
Colorado Memory System DJ-10 120MB Tape Backup	$198.00(192.00)
Colorado Memory System DJ-20 250MB Tape Backup	$262.00(258.00)
Colorado Memory System AB-11 External Tape Backup Adapter Kit	$40.00(38.00)
Colorado Memory System FC-10 500kb/s-1Mb/s Adapter Kit	$90.00(87.00)
Colorado Memory System TC-15 Data Compression Adapter Kit	$190.00(184.00)
Colorado Memory System KE-09 External Drive Kit	$85.00(82.00)
Cyrix 83X87-16/IIT3C87SX-16 Math Coprocessor	$113.00/$110.00
Cyrix 83X87-20/IIT3C87SX-20 Math Coprocessor	$126.00/$125.00
Cyrix 83X87-25/IIT3C87SX-25 Math Coprocessor	$136.00/$130.00
Cyrix 83D87-25/IIT3C87DX-25 Math Coprocessor	$158.00/$146.00
Cyrix 83D87-33/IIT3C87DX-33 Math Coprocessor	$167.00/$156.00
Cyrix 83D87-40/IIT3C87DX-40 Math Coprocessor	$195.00/$193.00

14" POWER STATION ESSENCE 486-33LB SYSTEM

- 14" ViewSonic5E w/72Hz Refresh rate & Flicker Free Display, SVGA 1024x768 NI
- Fahrenheit 1280D 32bit Local Bus, S3 Graphics Accelerator w/1 MB VRAM
- 256K Spr Fast Write-Back Cache RAM
- Intel 80486DX-33 Microprocessor
- 8MB 70ns RAM, Up. to 32MB
- 1.2MB & 1.44MB Teac Floppy Drives
- 210MB 15ms IDE HDD w/64KB Cache
- 2 S, 1 P, & 1 G Ports
- Focus 5001 Keyboard
- 250 W. UL Power Suply
- Mid Size Tower Case w/Double Fan
- MicroSoft Windows 3.1 & MS DOS 5.0
- Hi-Resolution Mouse

$2,828.00

17" POWER STATION ESSENCE 486-33LB SYSTEM

- 17" ViewSonic7 w/72Hz Refresh rate & Flicker Free L. Rad. Digital Control Multi-Frequency VGA 1280x1024 NI w/1MB
- Fahrenheit 1280D 32bit Local Bus, S3 Graphics Accelerator w/1 MB VRAM
- 256K Spr Fast Write-Back Cache RAM
- Intel 80486DX-33 Microprocessor
- 8MB 70ns RAM, Up. to 32MB
- 1.2MB & 1.44MB Teac Floppy Drives
- 210MB 15ms IDE HDD w/64KB Cache
- 2 S, 1 P, & 1 G Ports
- Focus 5001 Keyboard
- 250 W. UL Power Suply
- Mid Size Tower Case w/Double Fan
- MicroSoft Windows 3.1 & MS DOS 5.0
- Hi-Resolution Mouse

$3,588.00

20" POWER STATION ESSENCE 486-33LB SYSTEM

- 20" ViewSonic 8 w/72Hz Refresh rate & Flicker Free Low Rad. Digital Control Display Multi-Freq. VGA 1280x1024 NI
- Fahrenheit 1280D 32bit Local Bus, S3 Graphics Accelerator w/1 MB VRAM
- 256K Spr Fast Write-Back Cache RAM
- Intel 80486DX-33 Microprocessor
- 8MB 70ns RAM, Up. to 32MB
- 1.2MB & 1.44MB Teac Floppy Drives
- 210MB 15ms IDE HDD w/64KB Cache
- 2 S, 1 P, & 1 G Ports
- Focus 5001 Keyboard
- 250 W. UL Power Suply
- Mid Size Tower Case w/Double Fan
- MicroSoft Windows 3.1 & MS DOS 5.0
- Hi-Resolution Mouse

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Orchid Fahrenheit

1280 1MB Graphics Accelerator $282.00 (272.00)

Orchid Fahrenheit 1280 is the graphics accelerator that speeds up Windows applications an average of 12 times faster than standard super VGA cards. It provides up to 1280x1024 resolution for razor-sharp images, w/ Sierra RAMDAC you get 32,768 true colors & 72Hz refresh rates. It features an on-board graphics processor & Video RAM. Hardware-driven line drawing and BitBit makes opening, closing, and resizing windows instantaneous.

Single and Multi-frequency analog monitors support refresh rates to 72Hz. (e.g. IBM 8513, IBM 8514) Display or compatibles, Windows 3.x Auto CAD 109286, AutoCAD 10(386), AutoCAD11, Microsoft Word, WordPerfect, Lotus 1-2-3, Generic CAD, GEM VersaCAD, PCAD, Ventura Publisher PCAD, CADance & Cadkey.

Orchid ProDesigner IIs 1MB VGA Card...$189.00 (189.00)

Orchid ProDesigner II 1MB VGA Card.....$148.00 (142.00)

Terms & Conditions: All parts and systems carry a One Year Limited Warranty except monitors and printer which warranty by manufacturers. All sales on Monitor, Printer and Hard Disk Drives are final. NO REFUND. All returns are subjected to our approval and must have prior authorization. Return items must be in it's original condition, send shipping prepaid. All refunds or credits are less shipping and bank charges. All refund items must be returned within 14 days of invoice. There will be a 20% restocking fee after the 7 days period and within 30 days of invoice. Thereafter, only exchanges are available during the rest of the warranty period. Price, Specification & Availability subject to change without any notice. **All prices and availability subject to change without notice.**

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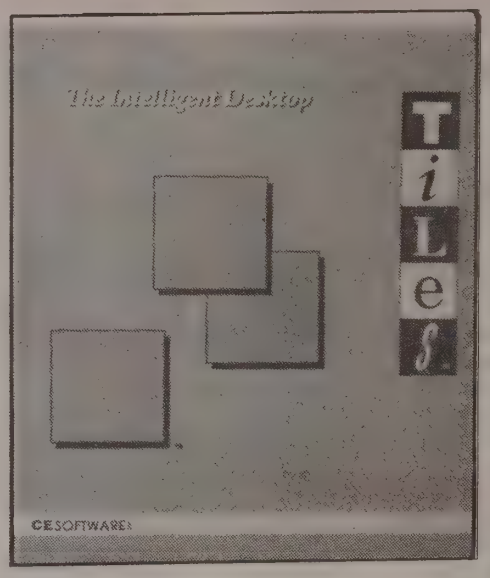

and make them faster or easier to use. The one area where new programs continue to appear is "utilities," that hard-to-define area that pretty much helps you manage your computer better. Utilities often sell as many copies per year as major applications, although they usually cost significantly less.

Two recent Macintosh utilities try to help a particular type of user: the person who has too many things happening at one time. If you normally run three or more programs at the same time, or you often open many documents for a single program together every day, Tiles and Power Windows may help you. Both programs make it easy to launch multiple programs and open groups of documents with a single action. Tiles doesn't do much more than that, and the only other major feature of Power Windows is the ability to change the arrangement of your windows. If you don't suffer from documentitis or window clutter, neither program will do much for you.

After you install Tiles, it watches what you do and creates small buttons (called *tiles*) on your desktop that correspond to running a program and opening a document. You can change the tiles to include more documents or more than one program. Thus, if you normally run Excel with two specific worksheets open and Word with five particular documents, all at the same time, you could create a tile that opens them all at once.

Power Windows takes a different tactic. It is mostly used to rearrange your windows to better fit your work style. For instance, you could make a screen template that causes the top window to take up the left two-thirds of the screen, with the other windows being shoe-horned into the right side. If you have a full-page or two-page monitor, you will find Power Windows more useful.

The value of these programs is questionable. Sure, opening or rearranging many windows is a pain, but is the time saved really worth $75 or $100? Given that you will probably change the mix of programs and documents that you open, you may spend as much time reconfiguring the programs as you would in the Open dialog box. (Kiwi Software, Inc., 6546 Pardall Rd., Santa Barbara, CA 93117. 805/685-4031. CE Software, Inc., PO Box 65580, West Des Moines, IA 50265. 515/224-1995) ■

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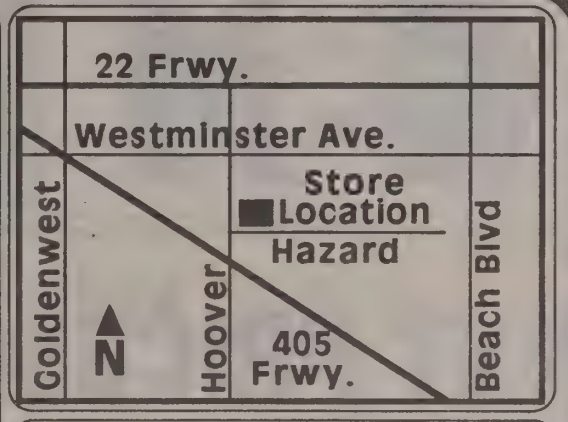

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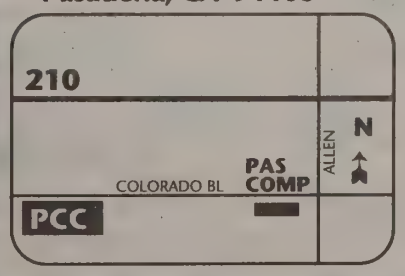

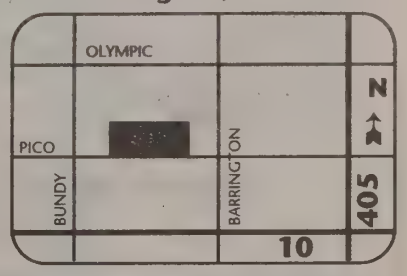

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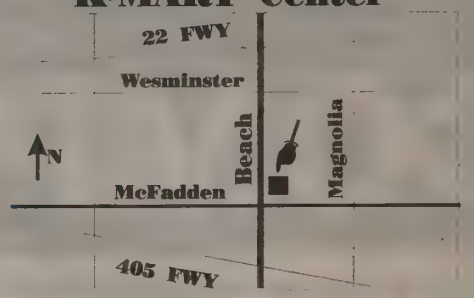

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Kodak's Photo CD: Digital Imaging For The '90s

The Possibilities Are Endless

BY TONY REVEAUX

Just when you're coming to terms with QuickTime, along comes another bonanza for computer-aided communication. This time, the innovation comes not from the computer industry, but from the consumer side. This shiny gold disk is Kodak's answer to digital imaging in the '90s.

Photo CD's features and capabilities will serve many needs of the mass and professional markets. Some will have a direct impact; others will sneak up on us over time.

For the personal computer user, high-quality, high-resolution, full-color digital images will be accessible at low storage overhead and low cost, and opportunities for interactive multimedia applications will be expanded. For the consumer, more options for photofinishing, display, and archiving will be readily accessible. The most profound implications of Photo CD come from its ability to catalyze digital information technologies and services.

THE PHOTO CD SYSTEM

You bring a roll of 35mm film to a photofinishing outlet that has access to the Photo CD Imaging Management System, request a Photo CD transfer (24 exposures for $16–20). In one to three days, you get a gold CD disk in a plastic jewel box. The cover is a contact sheet with indexed color thumbnails, revealing the results of your photography.

You may order prints and slides to be struck from either the negatives or the Photo CD. In time, selected outlets will provide a customer-controlled viewing/editing station where you can preview the images and select special order prints with cropping, rotation, zooms, pans, and filters. Not to mention decorative borders, vignettes, and text—and eventually, sound. I tried out a prototype last year; its Fisher-Price style of console interface design was very easy to use, and should encourage the creativity of the average customer.

If you own a Kodak Photo CD player (about $400; available summer), which will also play audio CDs, or a Philips CD-I player, the images can be viewed on a TV set with the same addressable selectivity as audio CD, and with visual controls such as rotation, zooms, and pans. The player will replace the slide projec-

Tony Reveaux, a San Francisco-based consultant, is the editor of Computer Publicity News *and a contributing editor for* Artweek, *and writes the "MediaScan" column in* Film/TapeWorld. *He can be reached via Usenet (luna@well.sf.ca.us) or MCIMail 290-3008.*

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Logitech Scanman Model 32 For MAC	~~$495~~	$219

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tor and screen, just as the camcorder/VCR has replaced home movies. Kodak plans to have retail photofinishing service outlets processing Photo CD available worldwide this summer, with one hundred thousand in place by year's end, and two hundred thousand by the end of 1993.

PHOTO CD ON YOUR PC

Through playback on an XA-compatible CD-ROM drive, you will be able to bring Photo CD images into your PC and Macintosh environments and implement them in your graphics, desktop publishing, and multimedia programs. Each image document supports five resolutions: thumbnail, snapshot, TV display quality, HDTV (for high-resolution image handling), and full detail, which is adequate for color prepress.

Kodak's Photo CD Access software will support Windows 3.0 for 24-bit RGB, 8-bit RGB (VGA), 4-bit RGB (VGA and EGA), 4-bit and 8-bit grayscale, bi-tonal, and PhotoYCC scheme. For the Macintosh System 6.05 and higher, it will support RGB, grayscale, bi-tonal, PhotoYCC scheme, and all color QuickDraw pixel depths, including 24-bit. The Windows edit is in DIB, Bitmap, Metafile, or Link; Macintosh is in PICT. Export formats for Windows are EPS, TIFF, RIFF, PCX, and BMP (DIB); for Macintosh, PICT, EPS, and TIFF.

The following vendor's programs will feature Photo CD support within the next few months as Kodak begins its installation of Photo CD facilities:

•Adobe is working with Kodak to ensure that its Macintosh-based Photoshop image retouching and manipulation program is fully compatible with Photo CD. Some developers are already using a prototype of a software module that imports Photo CD files directly into Photoshop.

•Photo CD for Windows isn't released yet either, as Kodak's libraries are not yet final, but the Windows environment will be well endowed with opportunities.

•Aldus's PhotoStyler will be adding direct file support for Photo CD.

•The Image-In Color Professional photo retouching program will have an import module, and Media Cybernetics' Halo Desktop Imager Windows 3 product will also read in Photo CD. These programs will recognize and accept a Photo CD document, which you will be able to read in from the Photo CD photo pack at one of the five supported levels of resolution, then you save as another appropriate graphic format such as PICT, EPS, TIFF, PCX, IMG, BMP, TGA, or GIF.

QUICKTIMING

Apple Computer has been working with Kodak for some time to integrate Photo CD into the next version of the QuickTime software extension. Because this move will fold Photo CD support into the operating system, virtually all Macintosh application software will be able to access Photo CD files directly.

The current Apple CD SC Plus CD-ROM drive can read single-session Photo CD images, and Apple will be releasing an enhanced, multiple-session drive later this year. One of Photo CD's intriguing capabilities is that it can be written once, and then written to as many times as you want until the storage capacity is fulfilled. That amounts to one hundred hi-res images, or up to eight hundred at TV display quality. Up to seventy-two minutes of CD-quality sound or eight hours of stereo sound, and combinations of text and graphics can also be added. The Photo CD is as important as an archival storage medium as well. Some users may keep the Photo CD as "permanent" backup for negatives; others will keep the film negatives as backup for the Photo CD applications.

THE DIGITAL ALTERNATIVE FOR IMAGING

Why not access these images with a digital camera and input them directly into the computer? For the professional service bureau or in-house production facility, a $100,000 high-level Kodak or Sony system will do just that. But it's going to be some years before most people can afford a high-resolution digital camera unit.

Logitech's FotoMan, a 96dpi, 256-gray-level digital still camera, lists for $799. But it takes low-res snapshots, not high-res color. FotoMan, like the Canon XapShot and Sony Mavica, is straining RAM chip and Charged Couple Device technologies to the contemporary limit. These camera systems are finding applications in real estate, inventory, employee identification, databases, and presentations.

Graphics arts professionals' solutions for high-resolution digital photography often include the input of original transparencies through a slide scanner system, such as a BarneyScan or Nikon. A video camera signal input through a frame capture board is another solution. While the images may not be very high resolution, the results can be very practical and effective for multimedia and presentation production.

Kodak's Photo CD system does an end-run around those limitations by providing a global, mass-market base to support economically priced digital imaging. The installed base of image capture devices—35mm cameras—ranks in the millions, and they are in the hands of people who already know how to use them.

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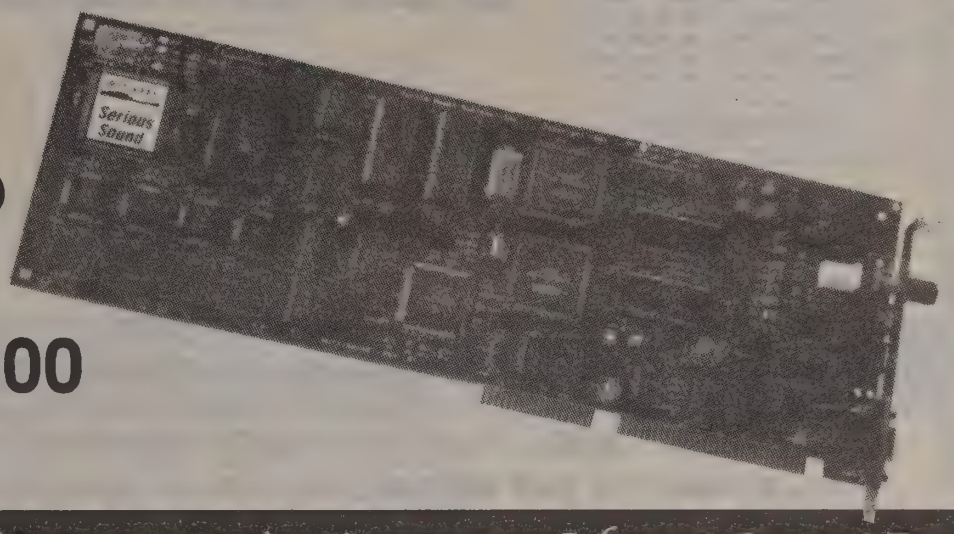

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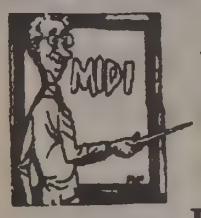

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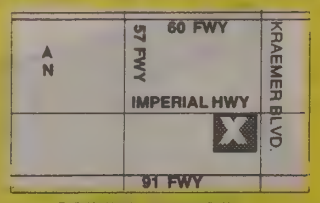

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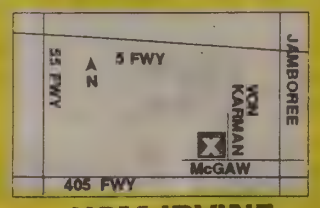

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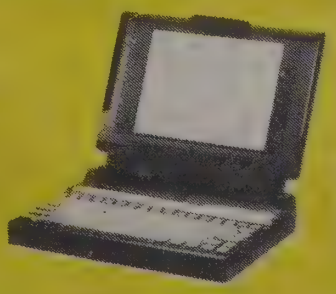

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film stock, as it does its other product line of emulsions, but it no longer processes it. You can still get Kodachrome processed—the Olympic Games, *Sports Illustrated,* and *National Geographic* still depend upon it. But photographers in general complain at how hard it has become to get service now, and are turning to other stocks.

Once you leave Kodachrome, high-resolution digital imagery can look pretty satisfactory. Can digital imagery match Kodachrome prints and transparencies? Can the music on CD compact disks match vinyls? Yes, a Kodachrome print from a custom lab on special paper may outshine the same image from a hi-res digital source, just as a mint virgin vinyl platter, played on a high-end tube system where the phono cartridge costs more than your whole hi-fi, can yield a richer sound than a CD. But for most workaday applications, digital imagery is gaining wider acceptance.

BIG YELLOW ON THE MOVE

Acceptance by Kodak means that the digital train is really leaving the station.

Eastman Kodak reached a point where it realized that despite its years of expansion and success, it could meet the same fate as the railroads, who concentrated on rails instead of transportation. Kodak deduced that it should concentrate on imaging rather than on silver halide-coated acetate. Kodak hired some of the best technologists and marketing research in the world before putting one big multibillion foot an inch forward.

WHY SHOULD YOU CARE?

Why should you care about these global marketing stories?

The Philips CD-I and the Commodore CDTV optical-based systems are both well developed, thoughtful solutions for full motion interactive multimedia, but there is no assurance that either of these incompatible competitors will still be around two or three years from now. Kodak's commitment to digital, coupled with its enormous network of installed retail channels, ensures consistent continuity of Photo CD as a development medium. They have really done their homework up in Rochester, and the Photo CD offers up a richly layered ecosystem of multimedia solutions, although there's no full-motion video. Yet.

The multimedia applications are extremely intriguing. As we speak, developers are working on prototypes of authoring strategies where you can use HyperCard or MacroMind Director to build interactive documents. Content developers will publish Photo CD titles that enable you to use your personal computer, or the remote control of a Photo CD player, to control a wide variety of audiovisual choices. For the home, interactive talking-photo albums and family trees can be configured.

Mail order catalogs, travel agency and real estate previews, sponsored news and sports handouts, and other commercial and business applications can be effective. The electronic coffee table book—a parallel to the still-image computer-aided videodisk system—may be the most popular. The National Geographic Society, the Sierra Club or the Metropolitan Museum can publish Photo CD "books," which allow the home viewer to look at, say, photos of Birds of the American West, then go to supportive text, and hear the sounds of their calls; or study Renaissance painting and hear music of the period and listen to commentary. If you have a computer with a CD-ROM drive or a videodisk player, you can enjoy these activities now. The Photo CD can reach an even wider audience. ■

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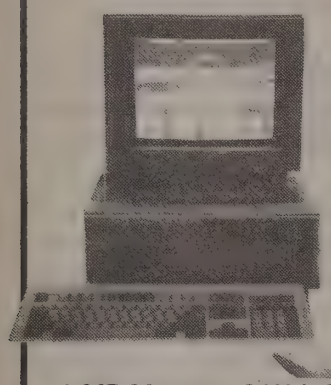

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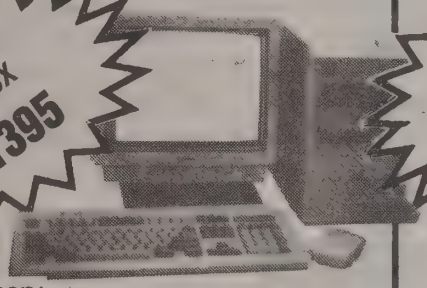

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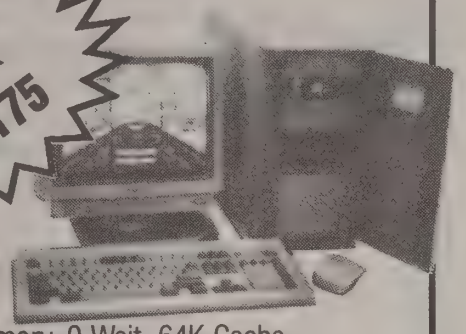

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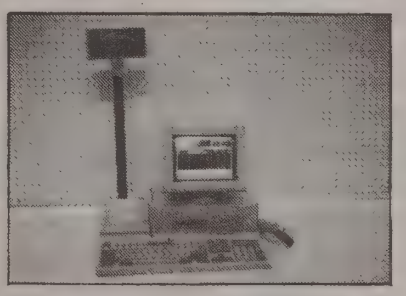

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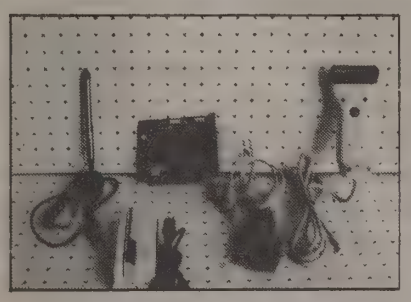

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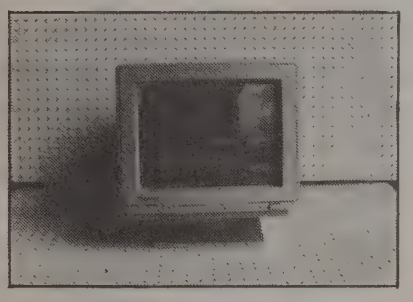

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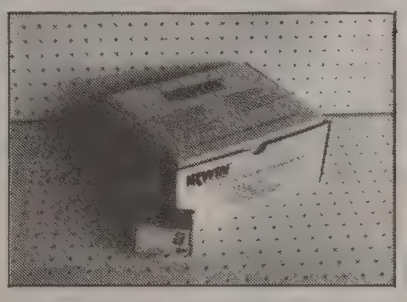

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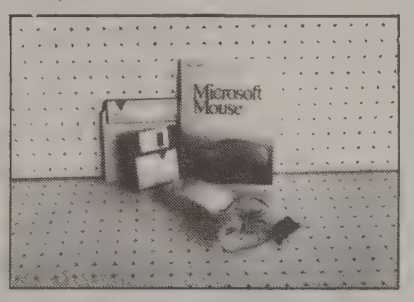

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Bugs In The Air

Springtime At BMUG

BY DAVID MORGENSTERN

Ah, spring at BMUG. Everything's in the air: frisbees, baseballs, pollen, and bugs—especially the bug reports. Even more disappointing, my expansive rhapsodic musings on computer paradox are being tempered to make room for virus reports. Is this your lucky day, or what?

THE PARADOX OF RELIABILITY

A paradox is a seemingly self-contradictory statement that still manages to express a truth. There are plenty of them to be found in the world of computing. You will share my paradox fixation in future *Paradoxes in Everyday Computing.*

The Paradox of Reliability: The more reliable the computer, the less it can be relied upon.

How can this be? Computer hardware and software are constantly being upgraded and improved. They are stuffed with super-fast memory and storage, produced to exacting quality standards. The technologist true believers point to their desktop idols as proof of progress. Unfortunately, reliability must be measured through the everyday use of a machine, not some laboratory benchmark.

BMUG

Computers are inherently unreliable. They are the most complicated inventions ever created by humankind. Even worse, the computer is not a static entity, it is a constantly changing dialectic system. Our data blasts around like speeding bumpercars on a global-sized freeway system, shrunk down to the size of a postage stamp.

The more we use our computers, the more we become susceptible to their failure. If you spend your time playing games, an occasional bomb is just a nuisance. But when we rely on the results of our computations, insisting on accuracy and stability to get a job done, we're in trouble. Although the software and hardware may have improved, our vulnerability to bombs and crashes has increased!

Users must realize that it's impossible to create the "perfect" machine that will never crash. The crash is a part of living with computers. Both biological and silicon systems suffer from hiccoughs.

Copyright© 1992 by David Morgenstern. All rights reserved. *David Morgenstern believes that computers and BMUG can cultivate a positive change in the world. He volunteers time at BMUG, when he's not working his "regular job," writing, or prowling around the BMUG Bulletin Board. He can be reached through the BMUG office, AOL: daviD eM, CIS: 72030,1607, and Internet: davidm@sfsuvax1.sfsu.edu.*

SEMI SOLID SEVEN

The Paradox of Reliability is evident in the Macintosh community's reaction to some problems with System 7. Some users are calling the new software a curse. They're having compatibility problems with their old software, getting the feeling that they're crashing more and enjoying it less.

System 7 is great, and adds loads of functionality to the base software package users receive when they fork over the dough. I miss its features when I work on non-seven-ized machines. But will it crash? Get real! There's no conspiracy of silence around new system software introductions.

But the BMUG HelpLine began hearing stories that seemed to point to something more than the run-of-the-mill operating system anomaly. It looked like a juicy bug!

Users would report that application, document, and folder icons would disappear from their parent folders. Even when the view is changed from Icon to Name or Date, the missing files would not reappear.

Strangely, if the sufferers would try a Find for the file name, the file would be found, and temporarily become visible in its former location on the desktop. While the file was visible, it could be opened, executed, and copied. But if the parent folder was closed and then reopened, the file was found to be missing yet again.

There were other permutations of folder and file problems, with loads of error messages and an occasional crash. A serious situation, with no word from the manufacturer. What is going on here?

DESKTOP MISMANAGEMENT

A problem of pre-System 7 Macs revolves around limitations of the Desktop file. This is an invisible file that hides on your disks. It remembers every icon it's ever seen, type and ID numbers of applications, and the folder IDs of applications. All this information requires a number of bytes for each item remembered. On a big hard disk drive, or CD-ROM, this adds up quickly.

Unfortunately, the Desktop file has a limit of 288K. The closer you get to the 288K limit, the more trouble your Mac has in keeping track of what's what on the disk. If you hit 288K—Crash! The solution was in an AppleShare file server utility called Desktop Manager. The functionality of this software was folded into System 7.

The new System 7 Finder creates two invisible data files to track all the files, folders, aliases, icons, and other goodies. One is called Desktop DB (database) and the other Desktop DF (datafile).

The information is stored in a special data structure called a B-Tree (my father says it's really a B-Tree Plus), which is a big list with branches. If you see a picture of one of these trees in a book, you'll find that they grow from the ceiling down to the ground, more like a genealogical family tree. The catalog file keeps track of what files are in which folders. The files don't really exist in a hierarchy, like a physical file cabinet; rather, the catalog "points" to its location on your disk drive. The Finder is like a squirrel running up and down the tree trunks and branches (folders) to the leaves (files), until it finds the nut it needs for lunch.

If something happens to the catalog file, and one of the tree limbs breaks, all the files below that link will be lost to the squirrel. Since the files are maintained in alphabetical order, the user might find that all the files that begin with letters after "Q" are getting lost. The System or Finder file would not be visible in the System folder, but the disk will still boot up. This is because the actual files aren't damaged, just the information that points to them.

The mysterious element in the story is the ability of the new System 7 Find command to discover the "lost" files. Find uses a new Toolbox call, PBCatSearch, to do the finding. PBCatSearch ignores the hierarchy of the catalog tree and just races along the links connecting all the files. It's like a flying squirrel that can stay high (or low on a computer

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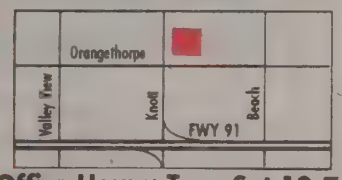

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tree) in the leaves, instead of running up and down. Find doesn't rely on all the hierarchical links being correct, it runs along the list of files looking for the one you want.

The common wisdom holds that most of these problems occur with files and folders *actually placed on the desktop itself.* There were changes in how files on the desktop are treated in System 7, and file dialog boxes now have a button that shoots straight to the desktop.

Here are some tips to help you avoid this particular bug in System 7—or to make the sting hurt less if it bites!

• Don't place your work on the desktop. I love littering my desktop with icons, even when I had a compact Mac. But System 7 gives us a way to safely place things where we want them by employing *aliases*! The alias points to the real file, folder, or application, and if it gets screwed up, you just make another alias.

• Since the Find function can uncover the hidden files, put a special character in the names of your most important files. This gives you the means to easily search through the files, without having to remember their names. Use the Key Caps desk accessory to check out the special characters available when pressing the Option or Shift keys.

• Rebuilding the Desktop file doesn't seem to help with this bug. A regular rebuild may result in a screwy desktop, especially if there was some existing damage. The best way is to delete the two files with a shareware utility, Desktop Reset, or commercial programs like DiskTools or Norton. This action forces the Finder to rebuild the desktop from scratch, which should result in a better job.

The word in March BMUG meetings was that Apple knows what's going on, but can't figure out how it happens. Some people think that someone discovered the answer, but the file was wiped out by the bug in question.

BIG BROTHER IS INFECTING YOU

The Macintosh world has been spared much of the virus agony suffered by the PC users. Our virus problems have usually been the result of poor coding, rather than malicious intent of the programmer. A virus may cause you some grief, but it's the action of the virus being a virus, instead of some awful planned destruction.

In late March, the INIT 1984 virus was discovered in the Netherlands and the US. It's a bad one.

The virus damages a large number of folders and files, which have their names changed to random one- to eight-character strings. File creators and file types are also changed to random four-character strings. This changes the icons associated with the files, and destroys the relationships between programs and their documents. The files' creation and modification dates are changed to Jan. 1, 1904. This makes it very difficult to easily recover your data with disk utility programs.

Like a number of its PC cousins, it's designed to trigger if an infected system is started on any Friday the 13th. A number of users were attacked in March 1992, but others may have been affected earlier, but thought their trouble was some "normal" hard drive problem.

The virus only infects system extensions, also known as Inits, or startup documents. It does not infect the System file, desktop files, control panel files, applications, or data files. The virus spreads from extension to extension when your Mac is booted.

Disinfectant 2.7.1, the terrific freeware antiviral program, is the updated version to deal with INIT 1984. John Norstad, the author, made some errors on the plain vanilla 2.7, so be sure to use the correct version. It's available from the BMUG office.

MORE TRICKS OF THE MACINTOSH MASTERS

The most impressive knowledge of the Macintosh is not always business-related. You can know your way around databases and spreadsheets, making yourself look great to the boss, but what about the groupies? They want the tricks!

A "trick" is something amusing or nonproductive that won't appear unless you do some action you wouldn't normally do. Some of them are bits of fun that were slipped in by the programmers, while others are unadvertised features.

• Macintosh IIci: Set the system date to 9/20/89, the release date of the IIci, set your monitor to 8-bit color, then restart while holding Command+Option+c+i. You'll see a neat color picture of the IIci design team appear. Click the mouse to continue. Remember to reset the correct date.

• Puzzle Desk Accessory 7.0: You can paste any picture into the Puzzle, and it will be sized to fit. You can also copy the picture from the Puzzle, and look at the clipboard to see what it will look like solved.

• QuickTime 1.0: Turn on Balloon Help and point to the QuickTime file. The balloon reads: "time n. A nonspatial continuum in which events occur in apparently irreversible succession from the past to the present to the future."

• Simple Player (for QuickTime) 1.0: Hold down Option as you select About Simple Player... The two movie frames now have grayscaled cats in them.

• ResEdit 2.x: Hold down Shift+Option+Command as you select About ResEdit... You get the chance to enter "pig mode," and the Mac makes the sound of a

What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its thirteen thousand international members. BMUG supports many Special Interest Groups (SIGs), a Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semiannual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center St. (a half block from the BART station), is open to the public 9 am to 5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510)849-9026, provide technical assistance and telephonic handholding during business hours (11 am–5 pm). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs, and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *TV-ROM*™, a fantastic collection of public domain QuickTime videos.

Our sixteen-line BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you were, as well as send mail to users everywhere! With our multiline capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most electronic services. BMUG can also be reached through the international USENET network through bmug@garnet.berkeley.edu.

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CREATIVE TOOLS

pig—"oink-oink-oink." When you put ResEdit into Pig Mode, resources will be compacted and purged each time ResEdit goes through its event loop, several times a second. I don't know why you'd want to do this, since this makes ResEdit slower. Perhaps it's a help to programmers that are being paid by the hour?

BYTES AND PIECES

• We've got a heavyweight addition to the list of BMUG publications—*The BMUG Guide to Bulletin Boards and Beyond.* It's by Bernard Aboba, chief sysop of the BMUG BBS, and telecommunications guru.

It has explicit instructions on how to get up to speed on bulletin board systems, using the BMUG BBS as a teaching aid. But there's plenty for every modem user in this 550-page book. There's detailed info on various international networks, Mac to PC or UNIX data exchange, the Internet, hardware—everything! It's $15 for members and $20 for nonmembers.

• If you're feeling blue because you don't have a Macworld Expo to go to on a Saturday night, then you should order the latest BMUG Expo video. *The Macworld Tour: San Francisco '92* tape follows me, your tour guide, around the Expo. I meet BMUGers and other celebrities—even the Software Ventures chicken. There's a good demonstration of Userland Frontier by one of its programmers. It's only $15. ■

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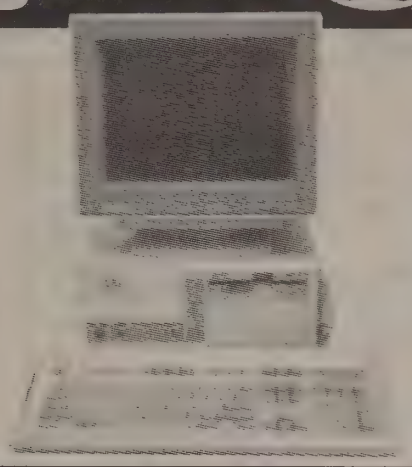

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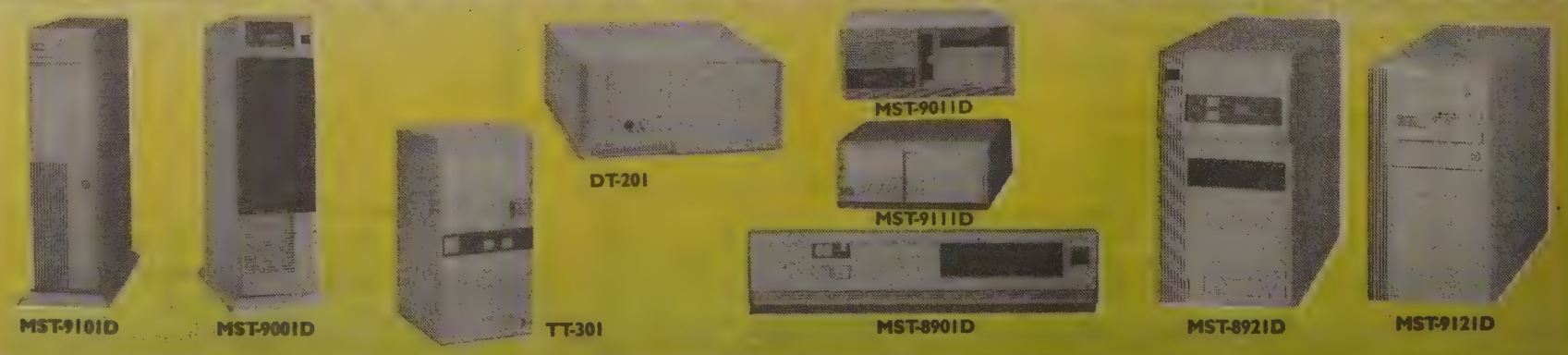

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Multimedia Tools And Toys

Paint, Animation, Video, And More

BY MATTHEW LEEDS

AMIGA

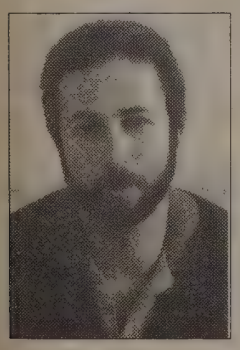
It's been out for a while, but this is the first chance I've had to mention Deluxe Paint 4 from Electronic Arts.

DPaint set the standard for the user interface of paint programs on the Amiga, and DPaint 3 brought a new level of animation to the genre. DPaint 4 now supports HAM, and a new color mixer has been added, so you can now interactively mix colors and create new ones. You can also save and load customized palettes and color sets as independent files.

Five different kinds of adjustable gradients are available. A paint stencil mode allows you to mask an area to protect the original design and colors while painting over it. A new antialias setting allows you to smooth out the edges of your design, eliminating the stair-step effect.

Animation is easier and more powerful with the new version. An on-screen, VCR-like control panel gives you more fluid and interactive control of your animations. The LightTable lets you display multiple frames under the current frame, so you can use a "key-frame" as a template, and easily paint in-between frames for an animation. Another feature, Metamorphosis, transforms two custom brushes into an AnimBrush over a designated number of frames, enabling you to transform, for example, an egg into a chicken.

DPaint 4 and AdPro 2.1 (see last month's column) both offer color pickers with a 256-color range. While the Amiga currently does not support 256 colors in any mode but HAM, the inclusion of color selection tools designed to support 256 colors suggests that these developers may know something about possible new features in a hypothetical new Amiga model.



Copyright© 1992. All rights reserved. *Matthew Leeds has been involved in the high-tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

NEW FROM MICROILLUSIONS

MicroIllusions shipped Genesis The Third Day, a fractal landscape generator. This program lets you create landscapes of real locations, using authentic government data, or imaginary locations by using an easy-to-use interface. You control the fractal dimensions, roughness, height, river networks, lakes, sea level, contour heights, shading, position of the sun, and more. You can set the observer viewpoint anywhere in the 3-D space around the landscape, and the camera has an adjustable focal length.

There are five drawing modes; and the colors are adjustable for each landscape element, even after the picture is drawn. Object files for most popular 3-D modeling and animation programs can be generated, and pictures can be saved as IFF images in low or high res, as HAM or as 24-bit files. Genesis also supports AREXX.

MORE CDTV TITLES

For those few of you who own a CDTV, or for those of you looking for a reason to buy a CDTV other than the small selection of software currently available for it, check out the growing library of CD+G and CD+MIDI discs from Warner New Media.

CD+G discs have graphics data encoded in special subcode channels on the disc, and these graphics can be displayed by the CDTV (or on an NEC TurboGrafx Game Machine). CD+MIDI discs have MIDI data in the subcode channels. If you've got a MIDI-capable synth or keyboard, you connect it to your CDTV and get additional music.

The "Presenting CD+MIDI Featuring Music from George Gershwin's Rapsody in Blue Performed by the Hambro Quartet" disc has both MIDI and +G subcode data. When it's connected to a MIDI device, you can listen to the performance as a solo, as a four-piano piece, or as a full orchestral performance. The +G graphics explain what is going on, as does a voice narration. The performance is also on the disc as standard CD-Audio.

If you're interested in other CD+G discs, here's a partial list of titles from Warner New Media:

Laura Branigan - *Laura Branigan* - Atlantic 82086

Ella Fitzgerald - *Ella/Things Ain't What They Used to Be* - Sire 26023

Flamin' Groovies - *Groovies' Greatest Grooves* - Sire 25948

Fleetwood Mac - *Behind the Mask* - Warner Bros. 26111

Emmylou Harris - *Pieces of the Sky* - Reprise

CD+G discs have graphics data encoded in special subcode channels on the disc. The graphics can be displayed by the CDTV. CD+MIDI discs have MIDI data in the subcode channels. If you've got a MIDI-capable synth or keyboard, you connect it to your CDTV and get additional music.

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L.Van Beethoven - *String Quartet No. 14* - WNM 15011
L. Van Beethoven - *Symphony No. 7* - WNM 15008
Beethoven/Liszt - *Symphony No. 9* - WNM 15009
Anton Bruckner - *Symphony No. 9* - WNM 15004
Gustav Holst - *The Planets* - WNM 15001
Gustav Mahler - *Symphony No. 5* - WNM 15007
W.A. Mozart - *Abduction From the Seraglio* - WNM 15006

GOLD DISK'S VIDEODIRECTOR

Gold Disk has shipped VideoDirector, a home video editing system. The system consists of the VideoDirector software, a universal "learning" infrared remote controller, and a serial port interface for controlling VCRs or camcorders equipped with remote, Control-L, or LANC inputs. The system allows users to view their video tapes using the computer to control the camcorder and VCR.

Any number of sections or clips can be selected, named, and arranged in any order. VideoDirector will then assemble the clips into an accurately edited final tape. VideoDirector also maintains a video database of each clip the user defines. The database keeps track of the clip's name, the name of the tape containing the clip, and the clip's exact location on the tape. Any clip in the database may be located and played.

Editing features include push button copying, cutting, and pasting of clips and groups of clips. A manual mode allows for the use of non-remote-controllable video equipment. On-screen prompts instruct the user to enter tape counter information and position the tape when required. VideoDirector supports the Digital Creations SuperGen for the addition of titles or graphics. Video interfaces to the Panasonic Selectra AG 1960/RS VCR, the Sony VDeck, the NEC PC-VCR, and the Selectra VuPort and Sony VBox are also supported.

VIDEO AGE

If you're using your Amiga for video work and have money burning a hole in your pocket, you may want to subscribe to *Video Age*, the newsletter of the Association of Professional Videographers. This newborn association and its newsletter are targeted at wedding, special event, instructional, industrial, documentary, and broadcast videographers. Talk about casting a wide net!

The first issue, all twelve pages of it, covers production techniques (use music to set the tone of your production), low-cost TBCs, practical editing formats, and other standard fare. Who knows, this might go somewhere. ■

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• HP IIP Plus	$ Call

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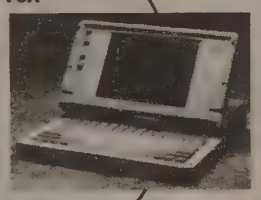

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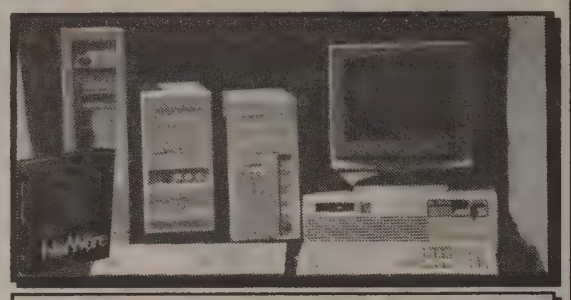

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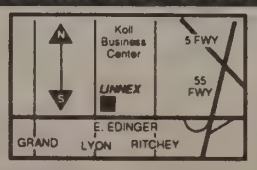

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BUSINESS SOLUTIONS

Continued from page 30

many stacks as you might want. Once again, a few simple keystrokes will move you from one stack to another.

A new feature in Info Select is the ability to dial telephone numbers inside a note. This means a single note can work as a phone directory: just search the directory for the name you want and then hit the keys to dial the number. Pretty slick!

One of the most powerful features of this program is the ability to create forms. Much like starting any other note, you create a master form. The difference is that the master form has distinct fields into which information can be entered. It is easy, for instance, to make a telephone message form that has fields for the name of the caller, the person called, the phone number, and a message. The message can be as long as you like. You can also set up the master form to automatically enter the date and time as well as sequence number of the note.

Info Select is well designed, so that with only minimal instruction, you can begin to benefit from this program right away. It is convenient for short entries like names, phone numbers, directions, product names—almost anything that formerly went on those little scraps of paper.

And a final feature to mention is the capability in this program for you to create simple lines and boxes on a form. This allows you to design forms that can be printed and duplicated for use by others as well as used within the Info Select program itself.

This is a worthwhile successor to an already excellent program. It will help eliminate the paper clutter on your desk and in your pocket. The program has many other powerful features that I have not mentioned, but it is important to point out that you can begin working with Info Select within minutes. ■

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Computer Of The Month

The Bondwell 386SL/F

Bondwell has long been known as a capable laptop manufacturer with strong engineering prowess. It is often hard to differentiate notebook computers these days because all of them are capable of doing the work they are intended to perform. But the new Bondwell entry has a few exciting twists that set it apart from the competition.

This notebook computer weighs 5.2lbs., measures 8.5" x 11" x 1.5", and is lightning fast with a clock speed of 25MHz. Two megabytes of RAM are included, which can be increased up to a total of 8MB. The 386SL/F comes standard with a 60MB hard disk and is powered by an energy efficient 80386SL chip.

The rechargeable NiCad battery in this Bondwell laptop will work for up to ten hours and takes only about two hours to recharge.

Bondwell has designed this machine for performance and slimness. To cut down on size and weight, it has included a 1.44MB floppy drive that plugs into the side of the machine. This external floppy drive is designed better than most other removable floppy drives and is very compact—it measures roughly 4" x 5" x 1.25". This makes it simple to pack almost anywhere and never be far from this drive.

The VGA screen is nearly 8.5" diagonally and displays sixty-four grayscale levels. An external color monitor is easily attached through the video port on the rear of the machine. If an external monitor is attached, the computer will boot up directly with that monitor displaying.

The keyboard is an 80-key design with embedded numeric keypad. Almost all of the small computers these days have this arrangement, which I personally find frustrating, but most also give you the option of attaching a keyboard of your choice. Unfortunately, Bondwell does not offer this option. This is the only major flaw I found with the design of this computer.

Notebook computers are always forced make compromises because of space and weight considerations. The compromise Bondwell made was to include only one serial and one parallel port. However, the built-in Hayes-compatible 2400 baud modem eliminates the problem of how to connect both a modem and a mouse—a basic requirement in today's computer market.

A unique feature of this computer is an elaborate alarm system designed to give warning signals if anyone attempts to move the computer when it is on or use it without an appropriate password. While much is made of this feature in the documentation, I was not terribly impressed; no serious thief is going to be put off by a meek computer alarm sound. Furthermore, the whole alarm system can be disabled by disconnecting the batteries and letting the backup power system run down.

Bondwell has designed a very nice system around the energy efficient processor. The rechargeable NiCad battery will work for up to ten hours and takes only about two hours to recharge. To help conserve power, the unit has an elaborate power conservation mode that shuts down the entire system after periods of nonuse. A touch of any key on the keyboard brings the computer back to life. If you know that you will be away from the computer, you can manually invoke the sleep mode until you are ready to use the machine again. This lets you effectively shut down the unit while in the middle of an application. This feature is becoming more common and is very convenient.

All in all, Bondwell has produced a good machine at a highly competitive price. ■

RESOURCES

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Model	H. Frequency	Dot	Resolution
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MF-5221A (30 to 80KHz, .31, 1280x1024	$2150
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486/50 MHz . . . . . .add $400

SPEED

Continued from page 36

ished output. Word processing from the appraisers is printed on the LaserJet II, and spreadsheets on the IIP.

In networks and other large peripheral sharing arrangements, the cabling is a key part of the system. This LANtastic network uses both twisted pair cabling in a daisy-chain arrangement and thicker shielded cable to avoid potential problems caused by signal interference. Most cables are run through the ceiling or in channels under the floor.

AN ACCOUNTING SOLUTION

When Penny Brown, the manager of computer operations at Semifreddi's, was considering a new accounting system, she believed some type of LAN was needed for this fast-growing Emeryville bakery. They had been running a modified version of an accounting program from SBT on a standalone PC. When their input and reporting needs overloaded this system, their consultant at Microstrategies Service recommended and installed additional computers and a peer-to-peer LAN from Invisible Software.

Most networked accounting applications, including SBTs, work best in the traditional client-server LAN environment. So, even though Semifreddi's had just installed a peer-to-peer network, all of its programs and data are stored on a single computer. The main difference between this arrangement and a traditional server-based network is that in a peer-to-peer LAN the server can still be used, simultaneously, as a workstation. Plus, the peer-to-peer network operating system is significantly easier to use and maintain.

"We started with just a single Compaq that belonged to one of the owners. But with both accounts receivable and general ledger we needed additional stations," said Penny. While initially apprehensive toward networks, she has been very satisfied with both the Invisible Network and the service from Microstrategies. "I do notice a slowdown in the applications when compared to how they ran on a single PC, but the trade-off of being able to do entry and lookup from multiple workstations, simultaneously, makes the difference well worth it."

It is interesting to note that Microstrategies owner Simrin Khalsa chose Invisible for its speed. "It's the fastest peer-to-peer network we've tested, and it's proven to be very reliable. It's also nice to have a local vendor for fast product delivery and problem resolution."

BEWARE: UPGRADING TO A NETWORK

Computerized accounting in general, and networked accounting in particular, often requires the services of a knowledgeable consultant. Roger Verdieck, of RPV Business Systems, specializes in networking AccountMate accounting software, from SourceMate Information Systems. One of his clients is C. M. Volkman Corp. of Oakland, a manufacturer of bird seed.

Volkman Corp. Vice President Lynn Jepsen is quick to cite the many difficulties they experienced with AccountMate software when they went from two single-user systems to a three-station LANtastic network. "None of it was the fault of the network. It was the upgrade of the programs and issues around multiuser access."

Problems are common with networked database and accounting applications. Both the network operating system and the applications program must share responsibility

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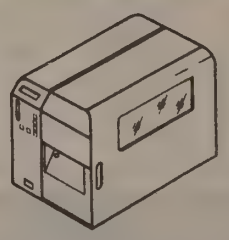

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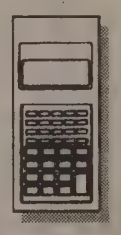

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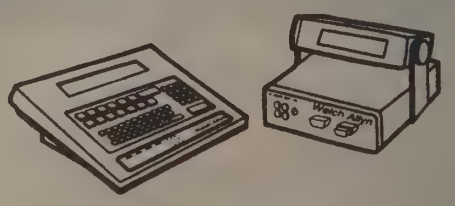

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T3100e	2MB Kit	119.00
T3200/SXC	2MB Kit	119.00
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8500	8MB Kit	429.00

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COMPAQ

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	2MB BD	149.00
	4MB BD	459.00
Portable LTE386S/20	1MB BD	179.00
	4MB BD	359.00
SLT/286	1MB BD	129.00
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SLT/386	1MB BD	139.00
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NEC

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Prem II SX/20	1MBKit	59.00
SX/16	4MB Kit	219.00
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Premium 386C	1MB Kit	59.00
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Fastram	512-2MB BD	289.00
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Premium 386	1MB Kit	59.00
	4MB Kit	249.00

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	4MB BD	299.00
	1MB MD	89.00
	4MB MD	209.00
DP-386S/16	1MB BD	119.00
	4MB BD	299.00
	1MB MD	89.00
	4MB MD	209.00
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	2MB MD	109.00
	4MB MD	249.00
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	2 MB BD	599.00
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IBM

w/Model	Memory Added	Price
50Z,55SX,70-E61, 70-121,P-70	1MB	$ 59.00
50Z,55SX,70-E61, 70-121,P-70	2MB	109.00
55SX,65SX,55LS, 34F3077	4MB	239.00
70-A21,A61,B21, B51	2MB	119.00
30,295	2MB	99.00
PS/1	2MB	119.00
80-041	1MB	79.00
80-111,31	2MB	139.00
80-A21,A31,A61	4MB	239.00
90,95	4MB	259.00
70,80	2MB BD	319.00
50 & 60 Series	2MB BD	299.00
50 & 60	2MB BD	249.00
PS/2 Model 57SX,90,95	8MB MD	499.00

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	4MB BD	579.00
	8MB BD	1,099.00
P.M.SX/20	2MBCPU UPG.	189.00
	2MB UPG. & Exp.	269.00
	2MB UPG. Kit	119.00
P.M.SX/16	2-8MB Exp.	249.00
	2MB UPG. Kit	149.00
P.M.386/20	2MB MD	349.00
	8MB MD	999.00
P.M.386/25S	2MB Kit	199.00
	8MB Kit	659.00
P.M.386/25	2MB MD	349.00
	8MB MD	859.00
	8MB Repl BD	1,199.00
P.M.386/33E&486/25E	2MB MD	279.00

ZENITH

	Memory Added	Price
Z-386/20, 25,33,33e	1MB SM	$ 69.00
	2MB SM	129.00
	4MB SM	259.00
Z-386SX, 286-LP+,Z-LS Mastersport SL	2MB SM	119.00
	2MB MD	199.00

Laser Printer Memory

Model	Memory Added	PRICE
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	2MB Module	119.00
	3MB Module	179.00
	4MB Module	209.00
H.P.Laserjet II,IID	1MB Module	85.00
	2MB Module	119.00
	4MB Module	209.00
H.P.Laserjet IIISi	1MB Module	69.00
	4MB Module	189.00
H.P.Deskjet	256K Module	109.00
IBM 4019,4019e	1MB Module	99.00
	2MB Module	139.00
	3.5MB Module	219.00
OKI Laser 400	1MB Module	109.00
	2MB Module	149.00
OKI Laser 800,820	1MB Module	109.00
	2MB Module	149.00
	4MB Module	199.00
Panasonic 4450	1MB Module	160.00
Panasonic 4420, 4450i	1MB Module	99.00
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1X9-70	45.00	4464-80	2.50
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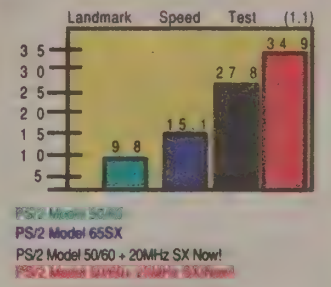

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83D87-16	199.00
83D87-20	189.00
83D87-25	189.00
83D87-33	199.00
83D87-40	229.00

intel

Part #	Price
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80387-33	219.00
80387-25	219.00
80387-20	219.00
80387-16	219.00
80387SX-20	159.00
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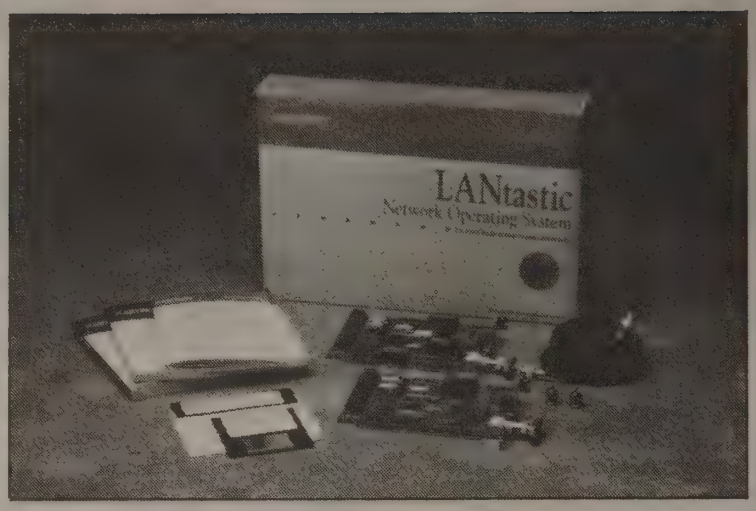

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for managing the access to data from multiple users. For example, what happens if two users try to change the same piece of data simultaneously?

Some problems will occur only under very specific conditions and go undetected until the user stumbles upon them. When alerted, the manufacturer will make the necessary program modifications and release a program update. The consultant's role is to distinguish between these program glitches and user errors, and recommend the appropriate action.

Lynn feels that the benefits of networked accounting data entry and access from multiple workstations outweigh the problems. And she is very thankful to be working with Roger. "We're one of the largest volume resellers of AccountMate in the Bay Area, so we have to know it well," he says. "When it comes to recommending a network, we want one that is easy to install and maintain so that we can concentrate on the accounting programs. We didn't want to spend the time, money, and energy necessary to become proficient with Novell."

CD-ROM-based information is among the newest applications to benefit from peer-to-peer networks. Many manuals and reference books for law, tax, accounting, demographic, and real estate are frequently updated and are now available on CD-ROM. Most peer-to-peer networks allow CD-ROM drive access to be easier and less expensive than it is with server-based networks.

CHOOSING TO CONNECT

Even with the cheaper, less complex peer-to-peer networks, it is important to do pre-installation planning and evaluation, and post-installation fine tuning. The relative simplicity of these packages allows the user to do more of this work and/or results in less labor time on the part of a professional network installer. Add this to the cost savings realized by not needing a dedicated server, and the difference in price for this type of network operating system versus a server-based product, and the amount is substantial. Even Novell has now realized this, with the release of their own NetWare Lite peer-to-peer product.

Typical peer-to-peer installations cost between $200 to $500 per computer for the network interface board, program, cabling, installation, and initial training. This brings networks into the reach of many small businesses, and the expense is often offset by the additional efficiency that the network allows. ■

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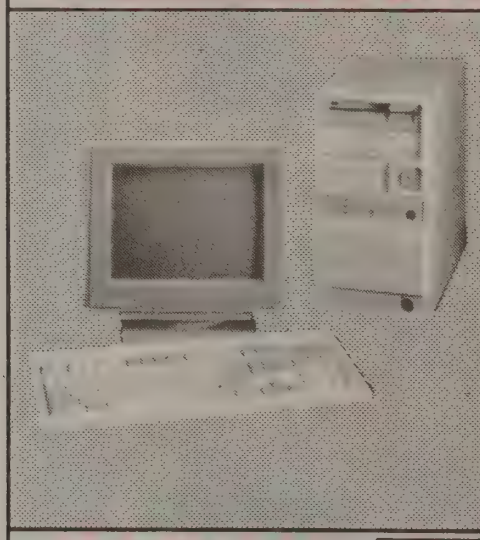

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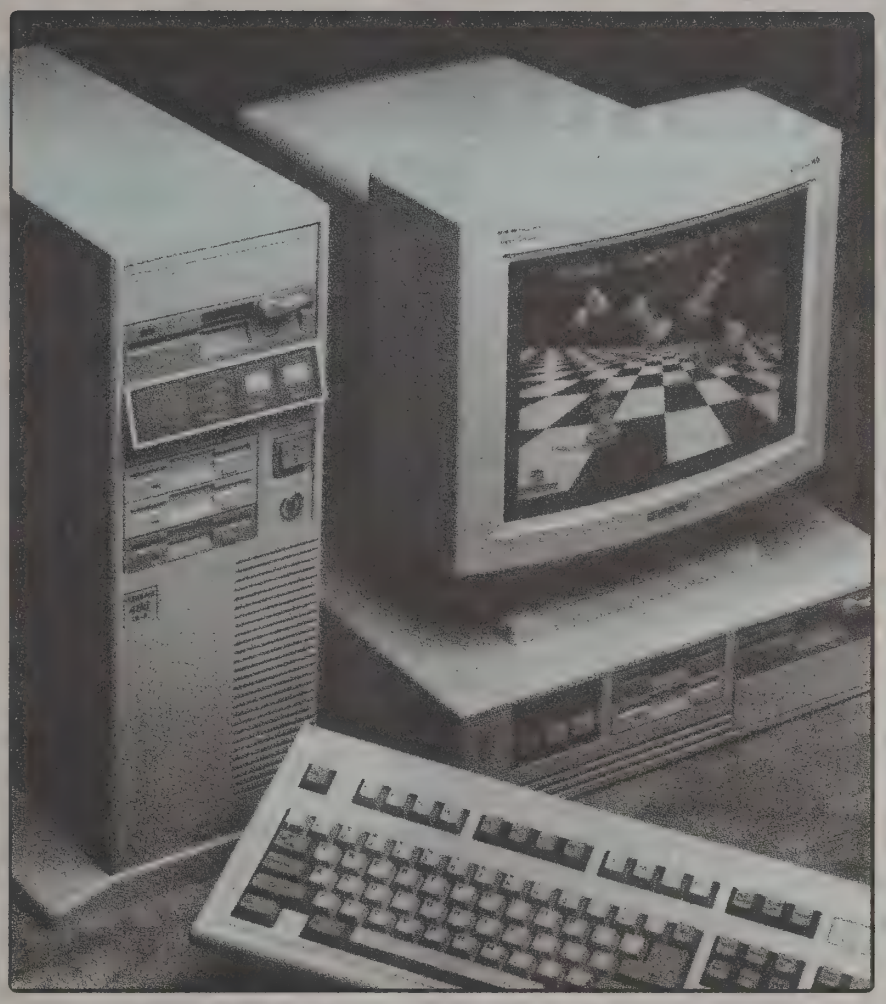

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RESOURCES

Calendar Of Events

APRIL

April 26 Computer Show & Sale. San Diego. MarketPro Shows. Call: (415)388-8893.

April 27–28 Pen Centric '92: International Symposium On Global Cooperation In Facing The Future Of Pen Computing. Tokyo. BigBang Technology, Inc. Call: (408)739-5708 or Japan at 81-3-5689-5611.

April 27–29 Novell 2.2 System Manager Course. Santa Ana. New Horizons Computer Learning Center. Call: (714)556-1220.

April 27–May 1 Downsizing/Rightsizing Corporate Computing Conference And Exposition. Los Angeles. Boston University Corporate Education Center. Call: 1-800-733-3593.

April 28–May 1 Hands-on UNIX In C Course. San Diego. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

April 30 MS-DOS For NetWare Users Course. Santa Ana. New Horizons Computer Learning Center. Call: (714)556-1220.

MAY

May 2 Computer Show & Sale. Anaheim Stadium. Richard James Corp. Call: 1-800-433-7469.

May 2 Computer Show & Sale. Ventura. MarketPro Shows. Call: (415)388-8893.

May 3 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

May 4–5 Application Development Technologies Seminar. Los Angeles. DCI. Call: (508)470-3880.

May 5 Panel Discussion On Managing Operating Systems Changes. Los Angeles. Microcomputer Managers Association, LA chapter. Call: (213)243-6843.

May 5–6 Sixth Annual Facsimile And Image Communications Conference. New York. BIS Strategic Decisions. Call: (617)878-6650 or 982-9500.

May 5–8 Hands-on Novell Networking Course. San Diego. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

May 5–8 OS/2: Comprehensive Hands-on Intro Course. Los Angeles. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

May 9 Computer Show & Sale. CSU, Northridge. Richard James Corp. Call: 1-800-433-7469.

May 11–12 Database/Word Processing Software Workshop. Los Angeles. Symantec Training Group. Call: 1-800-786-8620.

May 12–15 Intro To Datacomm And Networks Course. Los Angeles. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

May 13–15 Project Management Software Workshop. Los Angeles. Symantec Training Group. Call: 1-800-786-8620.

May 16–17 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

May 17 Computer Show & Sale. San Diego. MarketPro Shows. Call: (415)388-8893.

May 19–20 Ed Yourdon On Object-Oriented Analysis And Design Seminar. Los Angeles. SCI. Call: (508)470-3880.

May 20 Software Development Partnering Opportunities With Apple: Software Entrepreneurs' Forum Monthly Meeting. Palo Alto. SEF. Call: Barbara Cass, (415)854-7219.

May 23 Computer Show & Sale. CSU, Northridge. Richard James Corp. Call: 1-800-433-7469.

May 30 Computer Show. SDSU Aztec Center, San Diego. Computer Marketplace. Call: 1-800-800-5600.

May 30 Computer Show & Sale. Anaheim Stadium. Richard James Corp. Call: 1-800-433-7469.

May 31–June 6 Borland's Database Conference. Palm Desert. Borland. Call: 1-800-942-8872.

MAY 16–17

COMPUTER SHOW

Pomona

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JUNE

June 1–3 Collaboration '92: Conference Exploring The Intersection Of Corporate Culture And Information Technology. San Francisco. Graphics Communications Assoc. Call: (703)519-8160. Email: mern@well.sf.ca.us.

June 2 Panel Discussion On Client/Server Technology. Los Angeles. Microcomputer Managers Association, LA chapter. Call: (213)243-6843.

June 6 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

June 7 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

June 8–10 Securing Your Networks Conference. San Antonio, TX. CSI. Call: (415)905-2626.

June 8–12 USENIX Summer 1992 Technical Conference. San Antonio, TX. USENIX Assoc. Call: (714)588-8649.

June 9–12 Hands-on PC Configuration & Troubleshooting Course. Los Angeles. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

June 10–11 The Outsourcing Conference: Guidelines, Methodologies, And Issues. San

Continued

Call For Entries

1992 TRUEVISION VIDEOGRAPHICS COMPETITION

Video artists and designers are invited to submit entries for the 1992 Truevision Videographics Competition. This year's competition is open to entries in seventeen categories. Each image must be produced with a Truevision graphics engine. The Truevision hardware can be used with any compatible software and peripherals, providing they are identified on the entry form. Artists may submit as many as three entries, each with its own form. There is no entry fee. The deadline is midnight, June 5. Contact: Truevision Videographics Competition, Truevision, Inc., 7340 Shadeland Station, Indianapolis, IN 46256-3919. 1-800-344-TRUE.

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June 27, 1992 SATURDAY
L.A. Fairgrounds (Fairplex), Pomona

June 28, 1992 SUNDAY
Sherman Square Entertainment Center, Reseda

July 18, 1992 SATURDAY
L.A. Fairgrounds (Fairplex), Pomona

July 19, 1992 SUNDAY
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August 8, 1992 SATURDAY
L.A. Fairgrounds (Fairplex), Pomona

August 9, 1992 SUNDAY
Sherman Square Entertainment Center, Reseda

August 29, 1992 SATURDAY
L.A. Fairgrounds (Fairplex), Pomona

August 30, 1992 SUNDAY
Sequoia Conference Center, Buena Park

SPECIAL 2-DAY SHOW!
October 10 & 11, 1992 SATURDAY & SUNDAY
L.A. Fairgrounds (Fairplex), Pomona

ALL SAN DIEGO SHOWS HAVE BEEN CANCELLED

Calendar Of Events continued

Francisco. DCI. Call: (508)470-3880.

June 16–19 Hands-on Novell Networking Course. Los Angeles. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

June 16–19 Network Planning, Support & Management Course. San Diego. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

Call For Participation

ELEVENTH ANNUAL NATIONAL CONFERENCE: TECHNOLOGY & READING/LEARNING DIFFICULTIES

This year's conference has been expanded to provide a forum for persons interested in the use of technology in the area of "Integrating Technology Across the Curriculum," and/or in the specific areas of reading, learning disabilities, writing, adult literacy, E.S.L., and special needs. Proposals will be considered for one-hour and two-hour presentations, and for one-hour poster sessions describing or demonstrating practical, innovative ways in which technology is used in all levels and areas. The deadline for submissions is June 1. The conference will take place January 28–30, 1993, in Santa Clara. Contact: Diane Frost, Educational Computer Conferences, 1070 Crows Nest Way, Richmond, CA 94803. (510)222-1249.

June 18–20 Science, Mathematics, And Macintosh Conference. Santa Barbara. UCSB Extension. Call: (805)893-4143. Email: XU02JFE@ucsbuxa.ucsb.udu.

June 18–20 Tutorial Week '92: Series Of Seven Tutorials. Los Angeles. ACM. Call: Dave Oppenheim, (310)397-2546.

June 23–25 Seybold Digital World Conference And DemoCenter. Beverly Hilton Hotel, Beverly Hills. Seybold Seminars. Call: 1-800-777-6650.

June 23–25 Tenth Annual PC Expo. New York. Bruno Blenheim, Inc. Call: 1-800-829-3976.

June 29–July 1 Database World Conference & Expo. Boston. DCI. Call: (508)470-3880.

JULY

July 6–10 The International Conference On APL. St. Petersburg, FL. ACM, SIGAPL, and FinnAPL. Call: Lynn C. Shaw, (212)662-2406. Email: Lynn_Shaw@mts.cc.wyane.edu.

July 7–10 Informix Worldwide Users Conference. San Jose. Informix. Call: 1-800-247-0262.

July 12–17 Tenth National Conference On Artificial Intelligence. San Jose. AAAI. Call: (415)328-3123. Email: ncai@aaai.org.

July 13–14 Database/Word Processing Software Workshop. Los Angeles. Symantec Training Group. Call: 1-800-786-8620.

July 14–17 Hands-on PC Configuration & Troubleshooting Course. Los Angeles. Learning Group International. Call: 1-800-421-8166.

July 15–17 Project Management Software Workshop. Los Angeles. Symantec Training Group. Call: 1-800-786-8620.

July 20–22 Sun Expo. Anaheim. Publication and Communications, Inc. Call: 1-800-727-EXPO.

July 21–24 Hands-on UNIX In C Course. Los Angeles. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

July 26–31 SIGGRAPH '92. Chicago. ACM. Call: (312)321-6830. Email: info92@siggraph.org.

July 28–31 Effective Skills For Technical Managers Course. San Diego. Learning Group International. Call: Kimberly Sisson, 1-800-421-8166.

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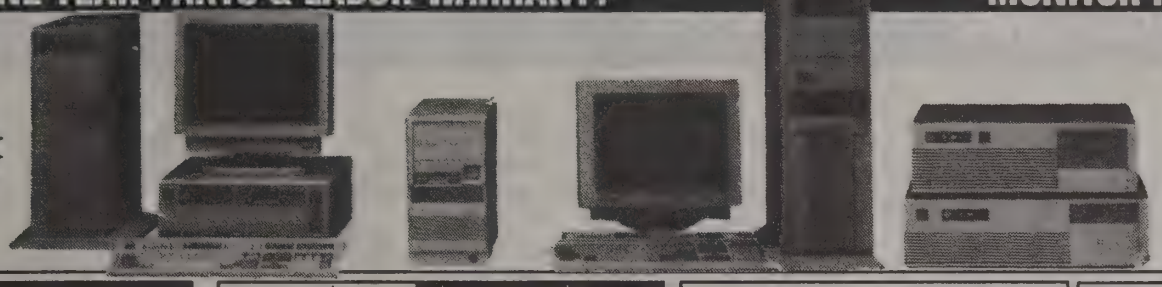

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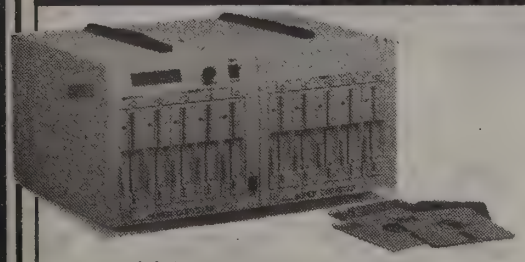

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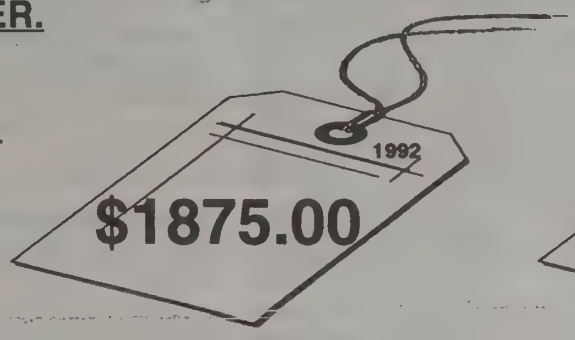

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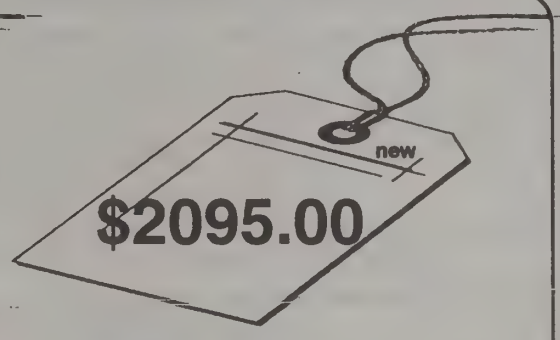

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Valley Apple Computer Club BBS. (818)782-6471. [Exp. #97.]

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ASSOCIATIONS

Black Data Processing Assoc., LA Chapter. Meetings: 4th Tues., 6:30 pm, ULTC, 7226 S. Figueroa St., Los Angeles. Call: (310)673-6522 or 1-800-727-BDPA. [Exp. #97.]

Data Processing Management Association. Meetings: 2nd Thurs., 7:00 pm. An organization composed of all levels of management personnel who have an interest in the field of information processing. Call: (310)549-9680 or (213)225-9210. [Exp. #99.]

FASCAL—Filipino American Society For Computer Activities And Literacy. Meetings: 2nd Sat. of alt. months, 1–4 pm, LA Midtown Hilton. Annual dues $20. Write: PO Box 3913, Chatsworth, CA 91313. [Exp. #95.]

Independent Computer Consultants Association, Los Angeles Chapter. Meetings: 1st Thurs., 6:00 pm, Proud Bird Restaurant, 11022 Aviation Blvd., Los Angeles. The LA chapter provides referral

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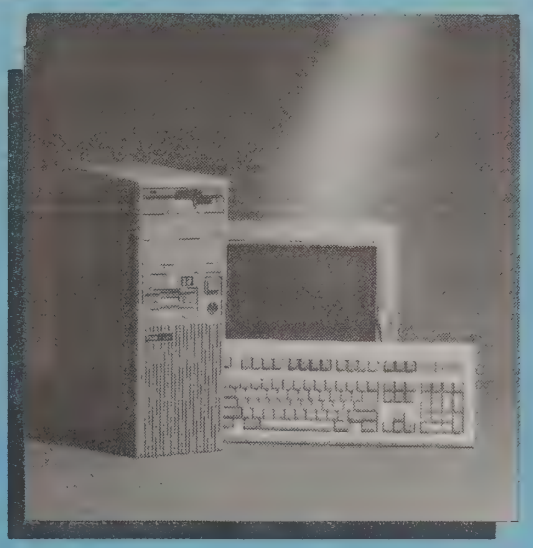

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Microcomputer Managers Association, Los Angeles Chapter. A forum for the discussion of issues relating to implementing and supporting microcomputer technology. Call: (213)243-6843. [Exp. #100.]

Orange County Association Of PICK Professionals. Meetings: 3rd Wed. Dinner: Members, $20; Non-members, $25. Without reservations add $5. Call: Paul Rogers, (714)641-6347 or 1-800-487-7877 ext. 6347. [Exp. #99.]

The Software Council Of Southern California (SCSC). Meetings: Last Wed., 6:00 pm, Long Beach Airport Marriott, 4700 Airport Plaza Dr., Long Beach. SCSC was founded to further the interests of software development organizations, as well as companies that provide support and services to the local software industry. Call: (310)328-0043. [Exp. #98.]

USER GROUPS

AMIGA

LAAUG—Los Angeles Amiga User Group. Meetings: 3rd Wed., 7:30 pm, Veteran's Memorial Auditorium, Overland Ave. & Culver Blvd. Many SIGs, rookies, monthly PD disks. Call: Kip Hammond, (310)390-3010. [Exp. #99.]

APPLE

Orange Apple Computer Club. Meetings: 1st Sat., 9:00 am, Orange Coast College, Chemistry Lab. Apple II supported. Call: (714)731-9243. [Exp. #99.]

Original Apple Corps, Apple II User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #99.]

Valley Apple Computer Club. Meetings: 3rd Tues., 7:30 pm. Cleveland High School, 8140 Van Alden, Reseda. Apple II, II+, IIc, IIe, and IIgs. No Macs. Call: Bill, (818)988-1852. [Exp. #100.]

ATARI

ATESIG—Atari 8-bit SIG. Meetings: 145 Surf Pl., Seal Beach. Cooperative user group for Model Railroad applications. Call: (310)430-5433. [Exp. #100.]

RAM Atari ST User Group Of Ventura County. Meetings: 3rd Wed., 7:30 pm, Call: Tim McCoy, (805)389-0059. [Exp. #97.]

South Bay Atari Computer Enthusiasts. Meetings: 2nd Tues., 7:30 pm, Lomita VFW Hall, 1865 W. Lomita Blvd. Active since 1985, novices & all skills welcome. Call: (310)375-4839. [Exp. #97.]

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CAD/CAM

Los Angeles Area AutoCAD User Group. Meetings: 4th Wed., 6:30 pm, Burbank Board of Realtor's Bldg., 2006 W. Magnolia Blvd., Burbank Meetings feature tutorials, Q&As, demos, hands-on, BBS, and newsletter. Call: M. Berman. (818)762-9966. [Exp. #96.]

COMMODORE

C128 West Commodore 128 User Group. Meetings: Covina & Santa Monica. Free membership. Large disk library. Call: John, (818)331-1589; Paul, (818)892-3859; BBS (714)598-1755 FidoNet. [Exp. #96.]

Commodore Helpers Of Long Beach. Meetings: 2nd Sat., 9:00 am. St. Timothy's Lutheran Church, Woodruff and Arbor in Lakewood. Supports 64/128 models. Call: Tom Hoy, (310)424-0508. [Exp. #99.]

Orange County Commodore Club. Meetings: 4th Sat., 11 am, Fidelity Federal Bank, 19900 Beach Blvd., (Newland Shpg Ctr) Huntington Beach. Call: Mike Moore, (714)668-9715. [Exp. #96.]

South Bay Commodore Users Group. Meetings: 3rd Thurs, 7:00 pm. SEC Redondo Generating Station, 1100 Harbor Dr. (across from King Yacht Harbor). Free and open to all who use or own Commodore computers and to those who would like to receive or exchange information on programs, applications, or hardware. Call: (310)324-8357. [Exp. #100.]

DESKTOP PUBLISHING

Southern California Ventura Publisher User Group (SC-VPUG). Meetings: Last Tues., 7:00 pm, 401 N. Brand, Glendale, Glendale Federal Bank Building. Product demos, Q&As, library resources. Call: (818)955-5830. [Exp. #100.]

VICUG—DTP (Valley IBM/Compatibles User Group—Desktop Publishing). Meetings: 1st Fri., 7:00 pm, Union Federal Savings Bank, 13330 Ventura Blvd., Sherman Oaks. Membership fee $25/yr or $3 at the door. Call: Harry Tischler, (818)997-1470. [Exp. #99.]

EPSON

SFV & LA Epson QX User Group. Meetings: 3rd Mon., 7:30 pm, The Meeting Place, Fallbrook Mall, Canoga Park. Call: Bill Winter, (818)347-7417. [Exp. #95.]

IBM & COMPATIBLES

Computer-RAP Club User Group. Meetings: 3rd Tues., 7:00 pm, 730 Pine Ave., #411, Downtown Long Beach. Call: (310)436-8944, between 6:30 pm–9:30 pm. [Exp. #95.]

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Christ King Lutheran, 2706 W. 182nd St., Torrance. Visitors welcome. Call: (310)542-4996. [Exp. #96.]

Long Beach IBM PC And Compatibles User Group. Meetings: 3rd Wed., 7:00 pm, Los Altos Methodist Church, 5950 E. Willow St., at Woodruff. Novices and experienced welcome. BBS, PD library, newsletter, and SIGs. Call: Jim Wells, (310)439-7114. [Exp. #97.]

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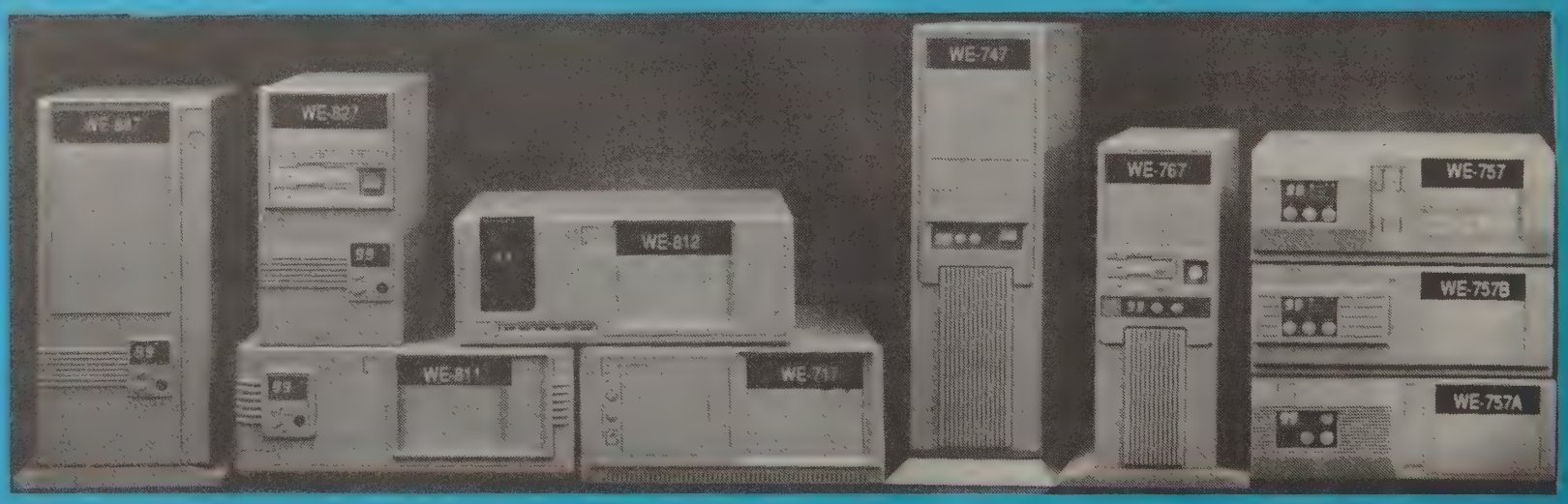

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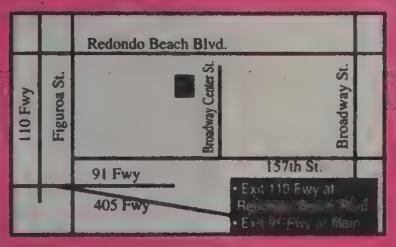

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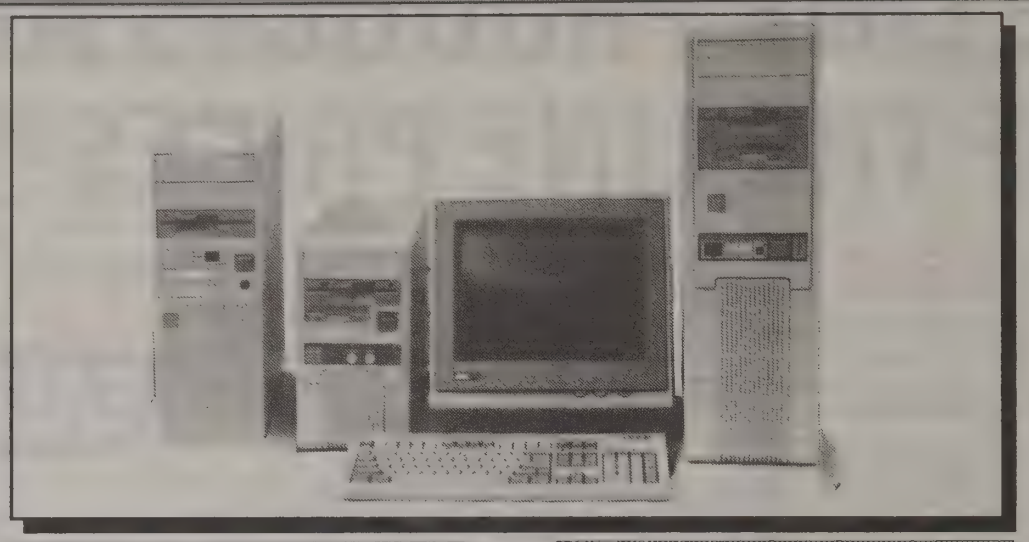

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Orange Coast IBM PC User Group. Meetings: Last Sat., 9:00 am. Orange Coast College. Speakers, BBS, software library, newsletter, and SIGs. Everyone welcome. Call: (714)843-2048. [Exp. #99.]

Pasadena IBM User Group. Meetings: 3rd Wed., 6:30 pm, Huntington School, 1700 Huntington Dr. Speakers on hardware/software, SIGs, BBS, library, and newsletter. Call: Steve Bass, (818)795-2300. [Exp. #96.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 4th Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)496-9699. [Exp. #99.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Burbank Board of Realtor's Bldg., 2006 W. Magnolia, Burbank. BBS, PD library, SIGs, newsletter. All welcome. Call: (818)842-3707 or (213)227-9684. [Exp. #96.]

Ventura PC User Group. Meetings: 3rd Sat., 9:00 am, Poinsettia Pavilion, Canada Larga Rm., 3451 Foothill Rd., Ventura. Guests welcome, no charge for attendance. Call: Kenn Ritza, (805)644-6955. [Exp. #99.]

VICUG (Valley IBM/Compatibles User Group). Meetings: 4th Fri., 7:00 pm, Security Pacific Bank, 14801 Ventura Blvd., Sherman Oaks. Membership fee $25/yr or $3 at the door. Call: Harry Tischler, (818)997-1470. [Exp. #99.]

KAYPRO

West Los Angeles Kaypro User Group/KAYOS Kaypro User Group. Meetings: 4th Mon. of even months, 6:30 pm, El Segundo. Call: Margot, (310)379-8339. [Exp. #96.]

K-MAN

Southern California KnowledgeMan User Group. Meetings: 1st Wed., 7:00 pm, Honda North America, Bldg. 300, 700 Van Ness Ave., Torrance. Call: (213)662-9910. [Exp. #100.]

MACINTOSH

The American Film Institute Mac User Group (AFIMUG). Meetings: 2nd Mon., Apple Lab, AFI, Hollywood. TV, film, and video. Call: Dave Chadderdon, (213)856-7743. [Exp. #97.]

Los Angeles Macintosh Group (LAMG). Meetings: 3rd Tues., 7:30 pm, Dept. of Water & Power, 111 N. Hope St. Free meetings, everyone welcome. Call: (310)278-LAMG. [Exp. #100.]

MacValley User Group. Meetings: 1st Wed., 7:30 pm, Wilkinson Senior Center, 8956 Vanalden, Northridge. Meetings, new product demos, newsletter, PD and shareware software, and more. Membership dues, $30/yr. Visitors welcome. Call: Bob Campbell, (818)784-8666. [Exp. #96.]

Orange Apple Computer Club. Meetings: 1st Sat., 9:00 am, Orange Coast College, Chemistry Lab. Macintosh supported. Call: (714)731-9243. [Exp. #99.]

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San Gabriel Valley Mac Users Group. Meetings: 1st Thurs., 7:30 pm, Pasadena Central Library Auditorium. Call: (213)684-ICON. [Exp. #97.]

West Orange County Macintosh User Group (WOCMUG). Meetings: last Tues., 7:00 pm, F&M Bank, 12535 Seal Beach Blvd., in the Rossmoor Shopping Center. Visitors always welcome! Topics for beginning to advanced users. Call: (310)493-1240. [Exp. #100.]

Whittier Area Mac User Group. Meetings: 2nd Sat., 10:00 am, Granada Heights Friends Church, La Mirada. Call: (310)947-2447. [Exp. #97.]

NeXT

Southern California NeXTSTEP User Group. Meetings: throughout LA County. Call: Mike Mahoney, (310)985-1550 or Bob Desharnais, (213)343-2056. [Exp. #100.]

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UNIX User Association Of Southern California. Meetings: 2nd Mon., 7:00 pm, New Horizons Learnings Center, 1231 E. Dyer Rd., Santa Ana. Call: Vince, (714)556-1220, ext. 126. [Exp. #100.]

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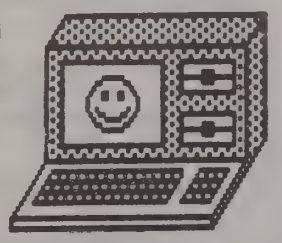

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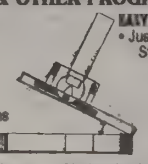

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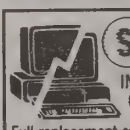

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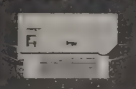

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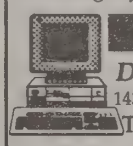

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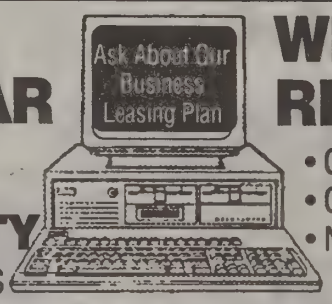

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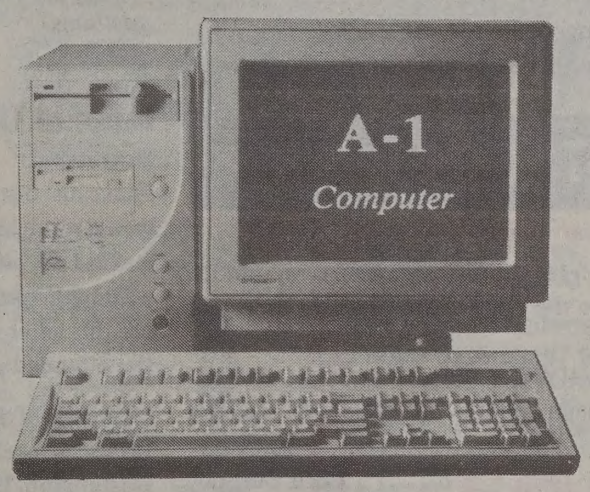

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Dear John Letters

The Dvorak Mailbag Overflows With Love: A Sampler

BY JOHN C. DVORAK

LATE CALLS AND FLOPPY OVERFLOW

Dear John:

1. I got a call at 6:30am Wednesday morning from a person from Borland wanting to give me this fantastic opportunity to upgrade to dBASE IV 1.5. (This was his second call). I got on the phone and explained it was 6:30 in the morning and I wrote the review of the product for a magazine (*PC Sources*). He asked if there was someone else in the organization he could talk to. He finally realized "this call is going nowhere."

2. Disk duplicators are complaining they have faced two price increases on 720K diskettes in less than one month, with the prices rising a total of 6 cents a diskette. The duplicators are thinking forced shortage.

3. IBM and Microsoft have cornered the diskette market. Microsoft is gobbling about 10 million diskettes this month, 6.5m for Windows 3.1 alone (6—3.5 per package, 7—5 1/4 per package). IBM is reported to have about 10M diskettes for the OS/2 rollout (would represent 500,000 copies).

4. Tom Rawson (JP Software—4DOS) wonders what is the environment impact of these two major rollouts, manuals and diskettes hitting the landfills...

Chris Devoney

I wonder when we'll see a biodegradable floppy disk!

THE DEVIL'S COMPUTER DICTIONARY

Dear John,

I know you once had a listing of computer definitions, so here's mine:

Computer Terminology for the Compleat Idiot

APPLICATIONS	Resumes
ARCNET	How Noah Caught Fish
ASCII	Inquire
BASIC	Simple
BENCHMARK	A Scratch On A Work Table
BOOT DISK	To Kick A Record
BYTE	Done Before Chew
C	Between "B" and "D"
C++	Definitely Between "B" and "D"
CAD	Not A Gentleman
DATABASE	Something Said While Pointing At Home Plate
DEBUG	The Insect
DOS	One More Than Uno
FILE SERVER	Office Clerk
GUI	Sticky
HARD DRIVE	A Difficult Journey
KEYBOARD	Where To Hang Up Your Keys
LAN	Where You Build A House
MEMORY MANAGEMENT	Taking Notes
MICRO CHANNEL	Television Station For Small TV Sets
MICROPROCESSOR	A Tiny Person Who Handles Paperwork
MOUSE	Something A Cat Plays With

[More later]

James E. LaBarre

With guys like this to supply me material I never have to write anything!

MODEM TAXATION!

Dear John,

I have just discovered that the FCC is considering a proposal which would result in a tax on modem and Fax use. Can you imagine? If you feel as I do, please pass along the word as I am doing and consider writing the proposed letter to both of these addresses. I decided to use this letter verbatim. I apologize for the cost of the Email time if I've offended you.

Chairman of the FCC
1919 M Street NW
Washington, DC 20554
or
Chairman House Telecommunications Subcommittee
B-331 Rayburn Building
Washington, DC 20515

Dear Sir:

Please allow me to express my displeasure with the FCC proposal which would authorize a surcharge for the use of modems on the telephone network. I feel that this regulation could be construed as an attempt to restrict the free exchange of information among computer users. Calls placed using modems require no special telephone company equipment and users already pay for the use of phone company equipment and telephone charges while online in the form of a monthly bill. In short, a modem call is the same as a voice call and should not be subject to any additional regulations or charges.

Sincerely,
(Your Name Here)

Thanks

Richard J. Brooks

© 1992 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

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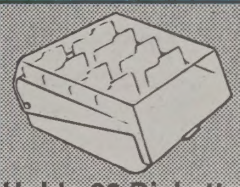

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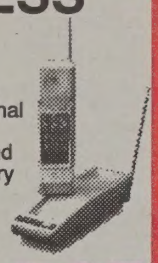

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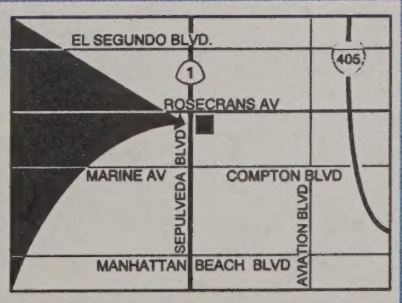

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PC Week Ratings	All Charge 386 3.2	Netroom 2.10	QMAPS 2.0	386Max/ BlueMax 6.00	QEMM 6.01 Analyst's Choice	Memory Commander 2.1
Software Compatibility	◒	●	○	◒	●	◒
Hardware Compatibility	◒	●	◒	◒	●	◒
Reliability	○	◒	○	◒	●	○
Ease of Use	◒	●	◒	◒	●	◒
Memory Management Flexibility	◒	●	◒	◒	●	◒
Quality of Documentation	◒	◒	◒	●	◒	◒

● GOOD ◒ SATISFACTORY ○ NEEDS IMPROVEMENT

PC Week rated QEMM 6 the best memory manager.

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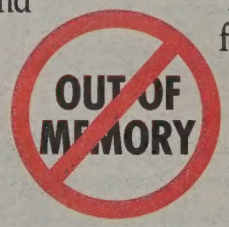

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Quarterdeck

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Key to comparison table: Software compatibility is defined as the product's ability to run without problems with the operating systems PC Week Labs used in testing, MS-DOS 5.0, IBM PC DOS 5.0 and Microsoft Windows 3.0, and with a variety of application software, including Quarterdeck's DESQview 2.40, Xerox Ventura Publisher 3.0 for DOS, WordPerfect 5.1 and Artisoft's LANtastic 4.0. Hardware compatibility is defined as the programs's ability to run on PC Week Lab's test hardware platform, which included a 33MHz 486-based PC and a 25MHz 386-based IBM PS/2 Model 70. Reliability ratings are based on the successful and dependable performance of each operating system and application-software package under each memory manager. Ease of use is based on ease of installing and configuring each program, based on support for automatic loading features and the intuitive narure of the interface. Flexibility in managing memory is rated on the range and quality of the product's features in optimizing system performance and handling special-case installation. Quality of documentation is judged by the clarity, comprehensiveness and helpfulness of the documentation provided with the product, based on the organization of the manuals as well as the thoroughness of definitions, directions and explanations, and the inclusion of troubleshooting information.

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